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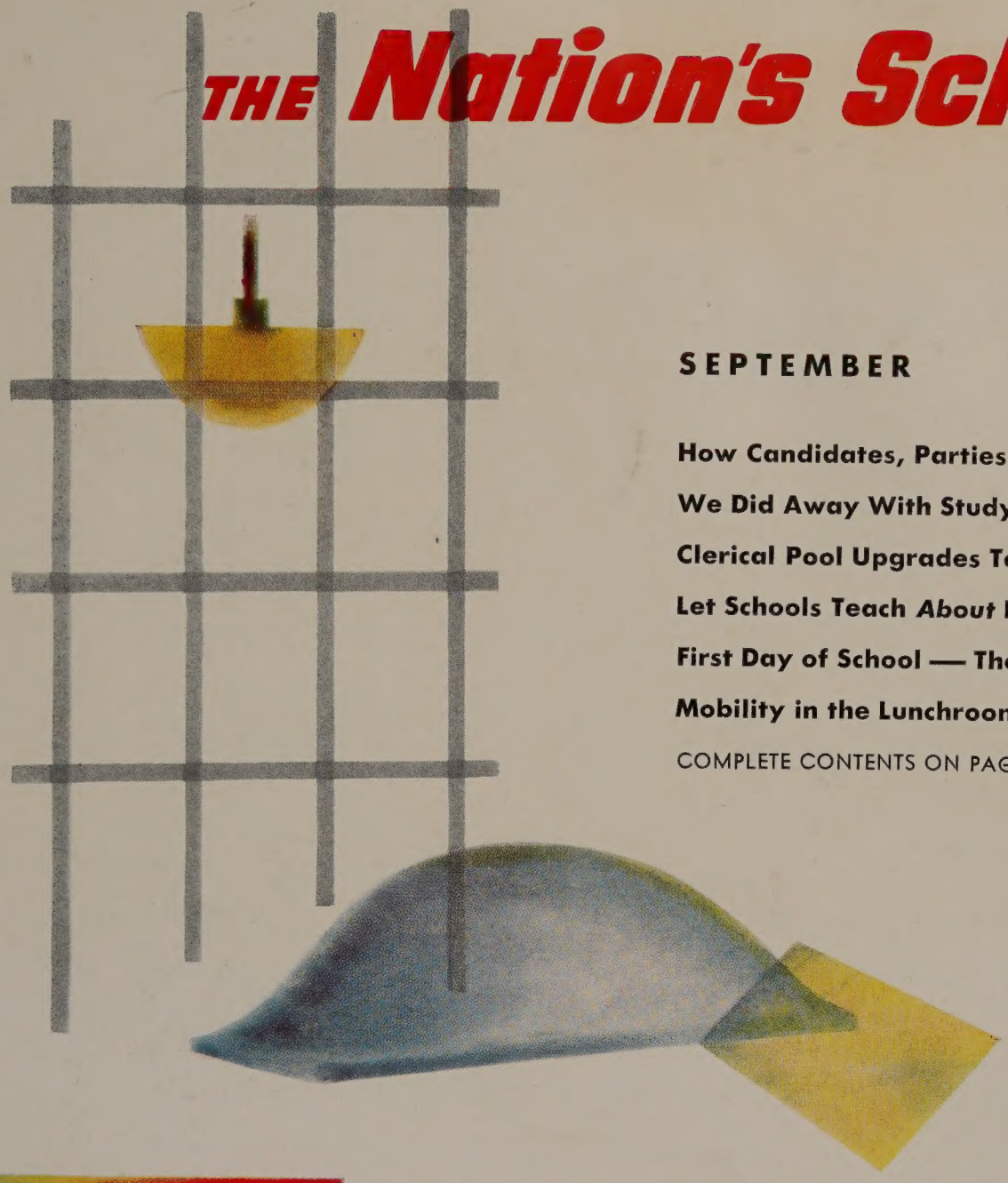
THE Nation's Schools



SEPTEMBER

How Candidates, Parties View Education

We Did Away With Study Halls

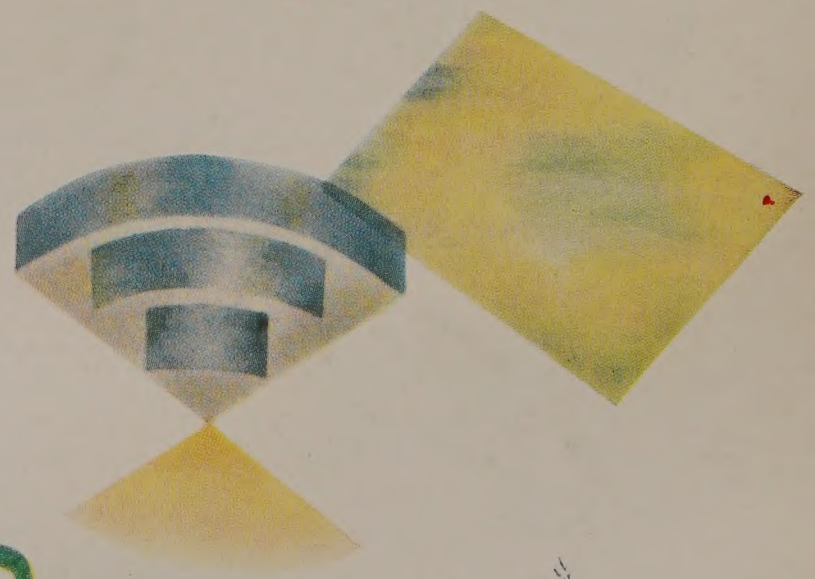
Clerical Pool Upgrades Teaching

Let Schools Teach *About* Religions

First Day of School — Then and Now

Mobility in the Lunchroom

COMPLETE CONTENTS ON PAGES 3 AND 4



Twenty-seven pages on

SCHOOL LIGHTING

Administration Study No. 7
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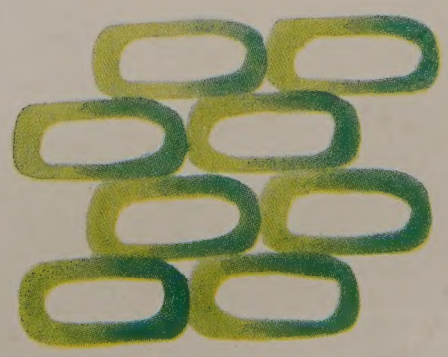

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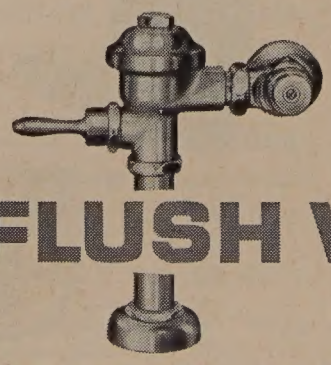

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THE Nation's Schools

THE MAGAZINE OF BETTER SCHOOL ADMINISTRATION

SEPTEMBER 1960

We Did Away With Study Halls 67 Edwin W. Bridges
Study halls were discontinued two years ago at Griffith (Ind.) High School. Results: more course offerings, fewer discipline problems.

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Memories of his own early teaching days make the Sage of Rochester thankful for today's methods of teacher education.

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Research, principles, know-how: These are without value unless the administrator applies them. This story tells how.

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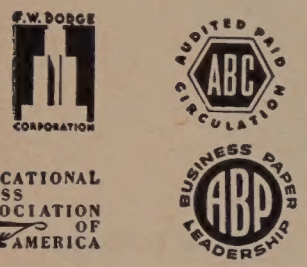

Editorial and publishing offices, 919 N. Michigan Ave., Chicago 11; Eastern office, 119 W. 40th St., New York 18; Cleveland advertising office, 321 Hanna Bldg., Cleveland 15. Western states advertising representative, Wettstein, Nowell & Johnson, Inc., Los Angeles, San Francisco.

Published monthly by The Modern Hospital Publishing Company, Inc. (subsidiary of F. W. Dodge Corporation), 919 N. Michigan, Chicago 11, Ill., U.S.A., Irving W. Hadsell, president; Robert F. Marshall, executive vice president; Robert M. Cunningham Jr., vice president and editorial director; H. Judd Payne, vice president; J. W. Cannon Jr., assistant vice president; Stanley R. Clague, secretary; Howard M. Thompson, treasurer. Subscriptions, 1 year, $4; 2 years, $6. Outside U.S., U.S.P., Canada, 1 year, $6; 2 years, $10. Current copies, $1 each. Member, Audit Bureau of Circulations; Associated Business Publications; Educational Press Association of America. Microfilms, University Microfilms, 313 N. First St., Ann Arbor, Mich. Second-class postage paid at Chicago, Ill., and at additional mailing offices. Published on the 20th of the month preceding date of issue. Allow 30 days preceding publication date for change of address.

Change of address notices, undeliverable copies and subscription orders should be sent to: The NATION'S SCHOOLS. Circulation Dept., 919 N. Michigan Ave., Chicago 11, Ill.

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Factual information about all great religions should be part of the public school curriculum but the teacher will have to be unbiased, say a majority of administrators, who also believe that the school is doing its part in teaching moral and spiritual values.

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The use of mobile equipment in the lunchroom saves about $5000 annually in employe costs at East High School in Rochester, N.Y. It also means fast service – about 1600 students are served in the two half-hour periods.

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When a school board decides to abandon an original project for a new school building, the architects are limited to compensation for services rendered only up to the date of abandonment, rules the court.

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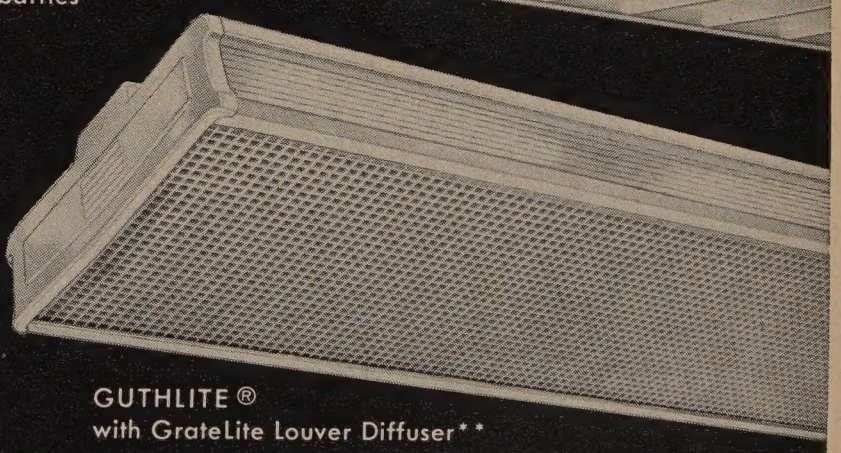

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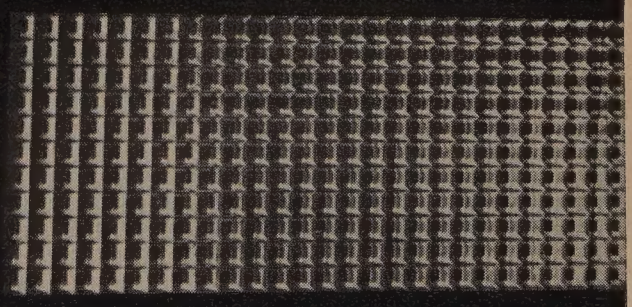

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ADMINISTRATOR'S CLINIC

By CALVIN GRIEDER
Professor of School Administration
University of Colorado

Kindergartens suffer from reduced budgets . . . Compulsory contributions, a euphemism for coercion . . . What price 'toughness'?

THERE is something thrilling and reassuring about the opening of a new school year. For generations the approach of autum has signalized the reopening of schools. It is the most important single element in returning to the normal round of daily life after a more or less hectic and disorganized summer. Things sort of settle down when school opens.

The trooping of more than 40 million children back to school is assuredly an impressive event to contemplate. In addition to this huge army of potential saints and sinners, there will be another 4 million or so carrying on beyond high school.

More than 2 million new kids will be entering school for the first time by way of kindergarten or first grade, affording welcome relief to more than 2 million loving mothers.

Some $3 billion of new schoolhouses will be put into service this year, for 2 million youngsters. About 100,000 new teachers will be facing their pupils this fall with a bit of trepidation. Salaries will reach new high levels with the median classroom teacher's pay falling probably between $5600 and $5700.

Most of this sounds rather optimistic and hopeful and it is, and a great many additional favorable aspects could be named.

There is also some cause to restrain one's enthusiasm. For example, more than one-third of the children of kindergarten age will not be in school. There are threats here and there of eliminating this unit as an economy measure, despite its demonstrated usefulness. An example of this is the action taken by the board in Wichita, Kan., early this year, tentatively providing for the elimination of kindergartens beginning in September 1961, unless additional revenue from nonproperty tax sources is forthcoming for kindergartens.

This would affect 6000 children and 120 teachers, and "save" about $500,000 a year. Suggested as only the first of a series of cutbacks, this action possibly would be followed by the elimination of vocational education, art, music, physical education, athletics, guidance, library services, and others.

At Chicago Heights, Ill., the board of Bloom Township High School voted early in July to take similar steps, abolishing all athletics, adult education classes, after-school use of the pool, and use of school facilities by outside groups. Two elections held for the increase of the school tax levy failed during the last 12 months. A new referendum is in the offing, but in the meantime these economy measures were adopted to reduce the estimated deficit for the next year from $100,000 to $45,000.

Incidentally, this is similar to the action taken in 1956 by the St. Paul, Minn., Board of Education, after the voters twice defeated amendments to raise the local tax levy limit provided for in the city charter. When the board and administration actually moved to close kindergartens, cut out all extracurricular activities including athletics, eliminate free use of buildings, and shorten the school day, the people couldn't stand it. They decided they'd rather have a full-fledged educational program than save a few dollars per taxpayer. One mother in Wichita is quoted as saying that the contemplated closing of kindergartens gave her the shakes.

Kansas City, Mo., went through an ordeal about a decade ago. When the North Central Association disaccredited its high schools for having less than nine months of school, the necessary funds were quickly voted by the people in spite of two or three earlier rejections.

A median salary of $5600 or more may sound fairly good to some people. Relatively, it isn't really good at all. To equal the widely acceptable *minimum* of $2400 in 1946 (adopted by law in seven states and by board action in many school systems), today's minimum would have to be about $5200. Thus $5600 is barely above a reasonable minimum figure for teaching.

There are still shortages of both qualified teachers and classrooms, deficits which are slowly being caught up with, but which will not be overcome for 20 years or more at the present rates of progress.

However, in so vast and far-flung an undertaking as the American educational system, it is natural that there be mingled plus and minus elements. There will always be problems and unfulfilled needs, and no doubt there will be, it is hoped, criticism by both the friends and enemies of public education. When all is said and done, our schools do provide a great stabilizing force, and a lively affirmation of our hope for the future.

American faith in education appears at some times and in some places to suffer from severe erosion. But the millions responding to the ringing of the school bells this fall certify that faith in education is far from moribund.

"Contributions," You Say?

A practice which at best is questionable is seemingly on the increase if I may judge from teachers' comments picked up in various parts of the country. I refer to compulsory "contributions," such as dues for professional associations, gifts for charity through a Community Chest or United Fund, and contributions to churches.

The procedure ordinarily followed provides for a vote by members of a

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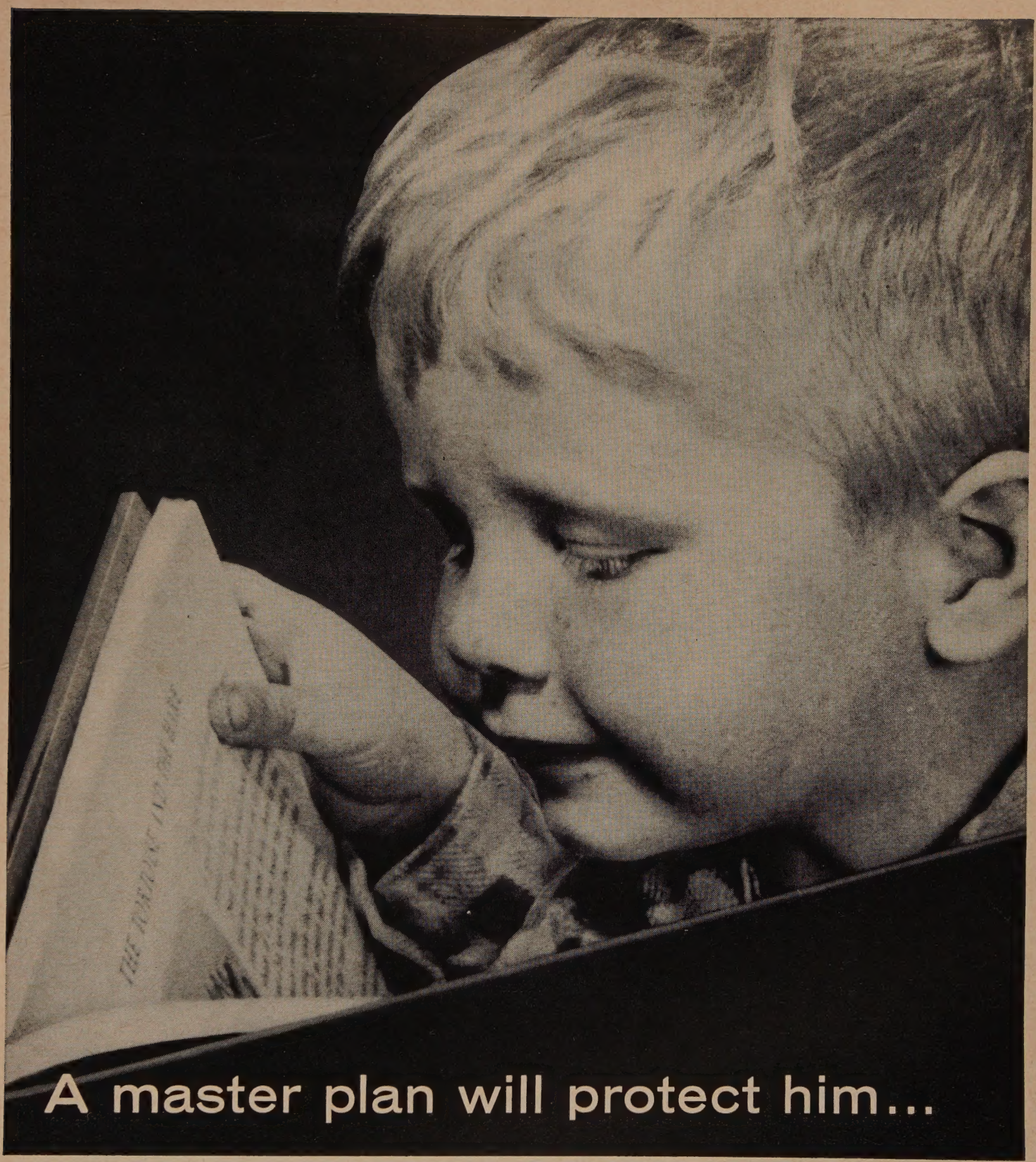

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group (teachers, noncertificated personnel, or administrative personnel) on whether specified deductions should be made from a monthly salary. The fund so created is administered by an elected representative committee. The deduction is in terms of a fixed percentage of pay, usually somewhere between a half per cent and 1 per cent. A person earning $5000 would thus contribute between $25 and $50 for the year.

This is a convenient way to pay one's dues to a professional association; also, it is an easy way to make contributions to charity and churches. The remittance of a substantial check by a community's teachers to the United Fund makes a favorable impression; it is good for public relations. Larger contributions and dues are stimulated by the installment method of paying them through salary deduction.

But notwithstanding its good points, the method is an invasion of private life and employs a degree of coercion that is certainly out of place in our profession. While it is true that an individual may refuse to participate if he wants to make an issue of it, it would take an unusually strong-minded and forceful character to do so. To withstand the pressure of the group might cause more tension and strain than most of us could take, even though we felt we were right in principle.

Where to draw the line is not easy to say. One position would rule out all deductions except those required by law: income taxes, social security payments, retirement contributions. This stand would not allow for group life insurance, hospitalization plans, and the like.

These are all, however, in a different class from charitable contributions and organization dues, which I believe should be left to the individual to pay. If a payment plan allowed for confidential communication directing the payroll office to deduct or not to deduct money, perhaps there could be no serious objection. It is the coercion implicit in efforts to get 100 per cent participation that is repugnant.

How Far to 'Toughness'?

Logical outcomes of the hue and cry for "tougher education" will be evidenced this year in many forms.

Longer school days and longer school years have been adopted in some school systems. Nothing as radical as 200 days has been accepted, so far as I know, where the school year has been shorter than that. The main effort has been to provide for 180 actual teaching days, with only a very few school systems adding anything beyond, although materially larger summer school enrollments are reported in many communities in all parts of the country.

School days are being lengthened by 15 minutes to half an hour in some cities. The advocates of the all-inclusive seven-hour day (including extracurricular activities) haven't met success as yet.

Homework is being reemphasized, but there is no uniform pattern. Much publicity has been given to proposals for homework of a half hour to an hour a day in Grades 4 to 6, one to two hours in Grades 7 to 9, and two to three hours in Grades 10 to 12. It looks as if some reformers are trying to get the kids to put in more time per week than adults do. Most working people put in 40 hours a week; some put in less, but very few put in more.

Discipline has come in for quite a bit of attention. The American people require the school to make up for deficiencies in the home, although the leading studies of juvenile delinquency conclude that the home is largely responsible as to whether a child becomes delinquent or not.

Even "mental discipline" has been revived, or at least it is being talked about. When mental or formal discipline was thrown out as invalid, just plain discipline was also a casualty. What most people mean when they talk about mental discipline is education for responsible work habits, completing a task once it's begun, doing an honest day's work for a day's pay, observing high standards of workmanship, and so on. With these who in any sense of justice can disagree, much less argue?

In general the movement for a more serious attitude toward schooling is wholesome. We do need a rehabilitation of discipline and responsibility in the senses just referred to. While welcoming it, we should also take care lest we let ourselves be stampeded into adopting extreme measures, which later will prove to be more foolish or harmful or evil than the weaknesses they were intended to ameliorate. ■

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LETTERS TO THE EDITOR

A.S.C.D. Resolution Directed at 'Discriminatory' Grouping

The May issue of The NATION'S SCHOOLS carried an extensive article on the Washington conference of the Association for Supervision and Curriculum Development. Certainly it is gratifying to know that A.S.C.D. gets such thorough coverage. However, I notice a misstatement in that article.

The resolution on "grouping" was directed at *discriminatory grouping*, not indiscriminate grouping. I think the association could be put into an embarrassing position if it were thought that we had settled on an innocuous statement condemning indiscriminate grouping. The point which the association accepted was that certain types of discriminatory grouping carry hazards which require considerable thought; consequently this is the reason for using that word in the resolution.

It is certainly fine that The NATION'S SCHOOLS has given much attention to A.S.C.D. We all hope, I am sure, that every step is being taken to enlist an alert curriculum leadership throughout the nation for the exercise of qualities of insight and interpretation they can bring to bear in this period of stress.—THEODORE D. RICE, *chairman, A.S.C.D. resolutions committee.*

Current Demand for Subsidies Basic Church-State Issue

Several letters to the editor have protested that the news story in The Nation's Schools pertaining to the group meeting that discussed separation of church and state at the A.A.-S.A. convention last February was incomplete. Highlights of two papers were summarized; one advocated tax support of parochial schools and another seemingly took the middle ground. At the time the story was written no advance copy was available of the third address by R. Freeman Butts. Dr. Butts has graciously supplied us with this release. — Ed.

"We should go no further in public support of private and parochial schools," believes R. Freeman Butts, the William F. Russell professor in the foundations of education at Teachers College, Columbia University.

"It is not simply a question whether free bus rides, free textbooks, free lunches, or free medical and health services should be provided equitably to parochial school children as well as to public school children. These questions are not now, and never have been, the fundamental issue," he said.

Dr. Butts states that since 1955 ". . . we have heard more and more of the argument that the rights of the parents in the education of their children are prior to the rights of the state; and the rights of the church in education are superior to those of the state. Therefore, the Catholic parent is obligated to follow the church rather than the state on educational matters. These are not new arguments; they are contained in the Encyclical Letter of Pius XI in 1929, but they are now being made more directly and more bluntly than ever before. They add up to the argument that the role of the state in education is subordinate to that of church and family; the state's real function is simply to aid the church and family to obtain the kind of education they wish. . . .

"We hear the argument that the only real purpose of taxation for education is merely to subsidize parents and thus aid them to get the kind of education they wish for their children. So, the argument implies, the whole idea of a common public school system managed and controlled by the public and supported by tax funds is really unnecessary. Genuine freedom of choice can be achieved by dividing up the common pool of tax money among *all* parents to do with as they please. This *would* be perfectly constitutional because it would not aid

(*Continued on page* 182)

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Many schools are using this profitable milk shake and ice cream dispensing method to help support their school-lunch programs. Others are using these profits to aid projects and activities.

All Sweden machines are as easy to operate as a cash register . . . as easy to maintain as a home refrigerator. They're easy to clean, too—no tools required.

Sweden's 25 years of leadership in the soft-serve ice cream and shake machine field assure you outstanding performance.

Counter and floor models for your specific needs. ShakeMaker capacities to 375 16-ounce shakes per hour. SoftServer ice cream capacities to 25 gallons per hour.

SWEDEN

If you would like to learn more about the fast, efficient service of healthful milk shakes and sundaes in your school, write today for additional information about the Sweden method.

SWEDEN FREEZER MANUFACTURING CO., Seattle 99, Wash. Dept. L-6

"Nous étudions le français intermédiaire."
"We're working on intermediate French."

"Nous sommes en train d'étudier le français élémentaire."
"We are studying elementary French."

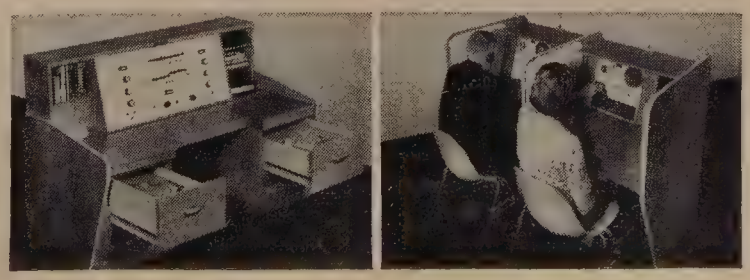
"Nous avons manqué la classe hier et nous ratrappons les leçons que nous avons manquées."
"We were absent yesterday and are making up the lessons we missed."

"Ce système-ci nous permet d'apprendre d'autant plus rapidement, nous suivons des cours de français plus avancés."
"This system enables us to learn so much faster, we are taking more advanced French lessons."

"Hacemos tareas en español durante nuestro período de estudios."
"We're working on Spanish assignments during our study period."

EDWARDS LANGUAGE LABORATORY

In this typical classroom situation, one 30-position, 2-channel Edwards Language Laboratory serves five simultaneous activities (4-channel models available when required). 13 beginners work on a master lesson using Lesson Channel 1. Nine intermediate students work on a second lesson using Channel 2. Three more advanced students work with tapes saved from an advanced class, recording their responses while erasing old practice material recorded by previous students. Three absentees make up work on tapes saved from a previous lesson. Two students use a free period for some independent lab work. The language laboratory is utilized to the fullest extent. Any number of separate lesson activities or subjects may be handled. The instructor has complete control over all 30 booths and can monitor or communicate with any student at any time. The instructor can utilize the Edwards Language Laboratory's extreme flexibility to include visual presentations, channeling sound for films, slides, TV, etc. through the lesson channel's auxiliary input. He can use the function selector's RECITE position to channel the recitation of one student (or a conversation between himself and one student) to the rest of the group. The instructor may pick up any student tape he desires to check, or to hold as a master tape for later use. **There are many language laboratories, but only Edwards offers such versatility and ease. Write today for detailed literature on this more effective teaching tool for creative language instruction.**



EDUCATIONAL EQUIPMENT DIVISION: Edwards Company, Inc., Dept. A-5, Norwalk, Connecticut; Edwards of Canada, Limited, Owen Sound, Ontario. Better Language Instruction, For More Students, The Most Effective Way.

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It's so easy to control lighting with STEELECO shades

There are STEELECO canvas duck window shades to give perfect light control for any building. And, STEELECO shades are durable, easy to adjust . . . economical, too, because they last years longer, here's why:

Reinforcing is used in all sewing to keep STEELECO shades looking new much longer. As an added precaution, shades do not come into contact with brackets.

Extra heavy Tex-Steele double-thread cotton duck gives added strength and body. No starches or fillers are used. Can be quickly washed, brushed or dry cleaned.

Long life bronze bearings insure smooth, quiet operation. Oversize springs respond instantly to your touch. Hardwood or metal slats . . . much larger and stronger than ordinary commercial slats.

Mail this coupon for free catalog and name of your nearest STEELECO dealer.

OLIVER C. STEELE MFG. CO.

Oliver C. Steele Mfg. Co.
Spiceland, Indiana

NAME_____

SCHOOL/FIRM_____

ADDRESS_____

CITY_____ STATE_____

Report from WASHINGTON

By EDGAR FULLER

Photo by Harris & Ewing, Washington, D.C.

FEDERAL SECURITY BUILDING
Headquarters for Department of Health, Education and Welfare

DEMOCRATS offer federal support for schools. REPUBLICANS promise federal "stimulation."

A comparison of the platforms on education adopted by two major political parties shows the Democrats promising considerable aid to schools, and the Republicans favoring "stimulation" for school construction only. A comparison of the two platforms and the complete texts follow:

The Democratic Platform. It favors substantial federal financing of public education. This includes both current expenses and school construction, with the precise uses of the federal funds determined by each state and allocated for the educational purposes it regards as most pressing. This leaves the major decisions to the states with a minimum of federal control of education, unlike smaller special aids which require more federal regulations. The platform indicates approval of a somewhat broader proposal than the Senate version of the legislation now pending in Congress.

Specific support for a Youth Conservation Corps along the lines of the program of the depression years reflects an attitude toward federal responsibilities that is frowned upon by conservatives in both parties.

The Republican Platform. It emphasizes local control and local-state financing of public schools, with federal "stimulation" rather than federal support. Federal funds for future programs would be limited to school construction, with the federal law requiring state matching from state funds prior to any federal financial participation. Local matching is rejected. This is in accord with the position of the administration in regard to the bills passed by the House and the Senate and now awaiting passage in this final session of Congress.

The Republicans oppose any large plan of federal aid to education, including funds for teachers' salaries and presumably for any substantial current expenses. In my appearance before the platform subcommittee in Chicago I gained the definite impression that its members really opposed all federal participation in the financing of education and that concessions to the contrary were based on political necessities.

The two platforms (verbatim) are:

DEMOCRATIC PLATFORM

The right to a good education: America's young people are our greatest resources for the future. Each of them deserves the education which will best develop his potentialities.

We shall act at once to help in building the classrooms and employing the teachers that are essential if the right to a good education is to have genuine meaning for all the youth of America in the decade ahead.

As a national investment in our future we propose a program of loans and scholarship grants to assure that qualified young Americans will have full opportunity for higher education, at the institutions of their choice, regardless of the income of their parents.

The new Democratic administration will end eight years of official neglect of our educational system.

America's education faces a financial crisis. The tremendous increase in the number of children of school and college age has far outrun the available supply of educational facilities and qualified teachers. The classroom shortage

alone is interfering with the education of 10 million students.

America's teachers, parents and school administrators have striven courageously to keep up with the increased challenge of education.

So have states and local communities. Education absorbs two-fifths of all their revenue. With limited resources, private educational institutions have shouldered their share of the burden.

Only the federal government is not doing its part. For eight years, measures for the relief of the educational crisis have been held up by the cynical maneuvers of the Republican party in Congress and the White House.

We believe that America can meet its educational obligations only with generous federal financial support, within the traditional framework of local control. The assistance will take the form of federal grants to states for educational purposes they deem most pressing, including classroom construction and teachers' salaries. It will include aid for the construction of academic facilities as well as dormitories at colleges and universities.

We pledge further federal support for all phases of vocational education for youth and adults, for libraries and adult education, for realizing the potential of educational television, and for exchange of students and teachers with other nations.

As part of a broader concern for young people we recommend establishment of a Youth Conservation Corps, to give underprivileged young people a rewarding experience in a healthful environment.

REPUBLICAN PLATFORM

The rapid pace of international developments serves to reemphasize dramatically the challenge which generations of Americans will face in the years ahead. We are reminded daily of the crucial importance of strengthening our system of education to prepare our youth for understanding and shaping the powerful emerging forces of the modern world and to permit the fullest possible development of individual capacities and potentialities.

We express our gratefulness and we praise the countless thousands of teachers who have devoted themselves in an inspired way toward the development of our greatest heritage — our own children — the youth of the country.

Education is not a luxury, nor a gift to be bestowed upon ourselves and our children. Education is an investment; our schools cannot become second best. Each person possesses the right to education; it is his birthright in a free republic.

Primary responsibility for education must remain with the local community and state. The federal government should assist selectively in strengthening education without interfering with full local control of schools. One objective of such federal assistance should be to help equalize educational opportunities. Under the Eisenhower-Nixon administration, the federal government will spend more than a billion dollars in 1960 to strengthen American education.

We commend the objective of the Republican administration in sponsoring the National Defense Education Act to stimulate improvement of study and teaching in selected fields at the local level.

Toward the goal of fullest possible educational opportunity for every American, we pledge these actions:

Federal support to the primary and secondary schools by a program of federal aid for school construction, pacing it to the real needs of individual school districts in states and territories, requiring state approval and participation.

Stimulation of actions designed to update and strengthen vocational education for both youth and adults.

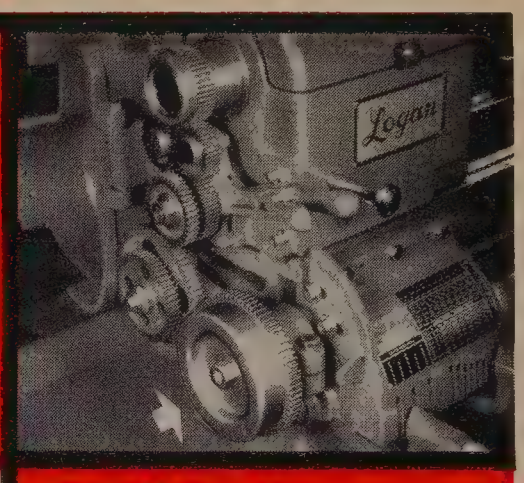
Support of efforts to make adequate library facilities available to all our citizens.

(*Continued on Page* 116)

new safety feature!

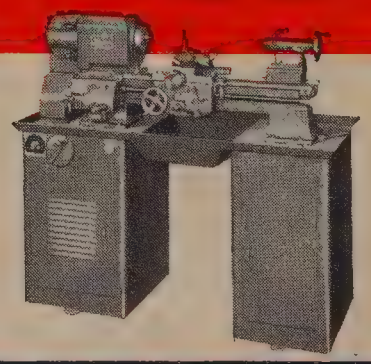
Logan

Automatic Safety Gear now standard equipment on 10" and 11" models

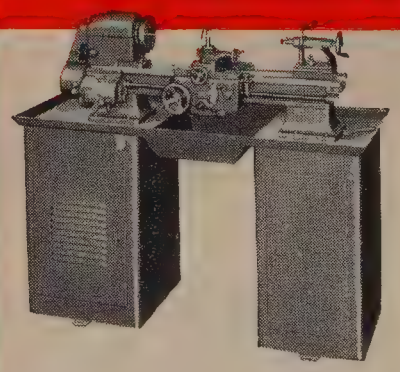


All Logan 11", 12" and 14" lathes, as well as models 1825 and 1875 (*shown*) 10" lathes, now offer positive overload protection without additional cost. Exclusive Automatic Safety Gear absorbs shock of sudden overloads when threading, preventing gear damage from spindle to gear box. Also protects all gears in gear box up to 52 threads per inch. The combination of this Safety Gear and spring-loaded lever-operated clutch in apron gives the same protection for corresponding feeds. Can be factory-installed on other models of new 10" and 9" quick-change lathes. Available for present Logan quick-change lathes: $10 for 9", 10" and 11" sizes, $15 for 12" and 14".

12" Lathe
Model 2555-V
12" swing, 1" collet, 1⅜" bore
(below)



10" Lathe
Model 1875
10" swing, ½" collet, 25/32" bore
(below)



For full model details and evidence of Logan's low upkeep and better service, see your Logan dealer, or write for catalog.

LOGAN ENGINEERING CO., Dept. F-960, 4901 Lawrence Ave., Chicago 30, Ill.

PROOF

HOLCOMB'S HYPAX BRUSHES ARE FIVE TIMES BETTER!

WHAT HYPAX IS . . . WHAT IT DOES FOR YOU

Hypax is Holcomb's miracle synthetic floor brush fiber, scientifically drawn and tempered to give it lasting snap and vigor . . . to make it the strongest, most durable brush fiber ever developed.

Hypax brushes sweep clean the first time over.

Hypax makes you a profit because it cuts sweeping time costs.

Hypax makes you an additional profit because it outwears natural fiber filled brushes at least 5 times, drastically cutting your brush replacement costs.

THIS AMAZING COMPARISON IS PROOF POSITIVE OF PROFITS TO YOU!

Chart shows two nationally advertised fiber filled brushes (A & B) and a Holcomb HYPAX Brush before use. Note the strength, straightness and sturdiness of Holcomb HYPAX stock!

After only 80 hours of wear note how brushes A & B are beginning to show wear, matting, bending and breaking of stock while the HYPAX Brush is good as new . . . no curling, matting or breaking of stock.

After 121½ hours of wear brushes A & B are worn out—ready for discard. The Holcomb HYPAX brush is only commencing its extra long life cycle of wear.

Illustrated above
THE DIXIE

Ask your Holcombman to help you select the Hypax Brushes that are "job engineered" for your needs.

COACH
For Smooth Floors
All Dirt

SHIRE
For Medium Floors
Fine Dirt

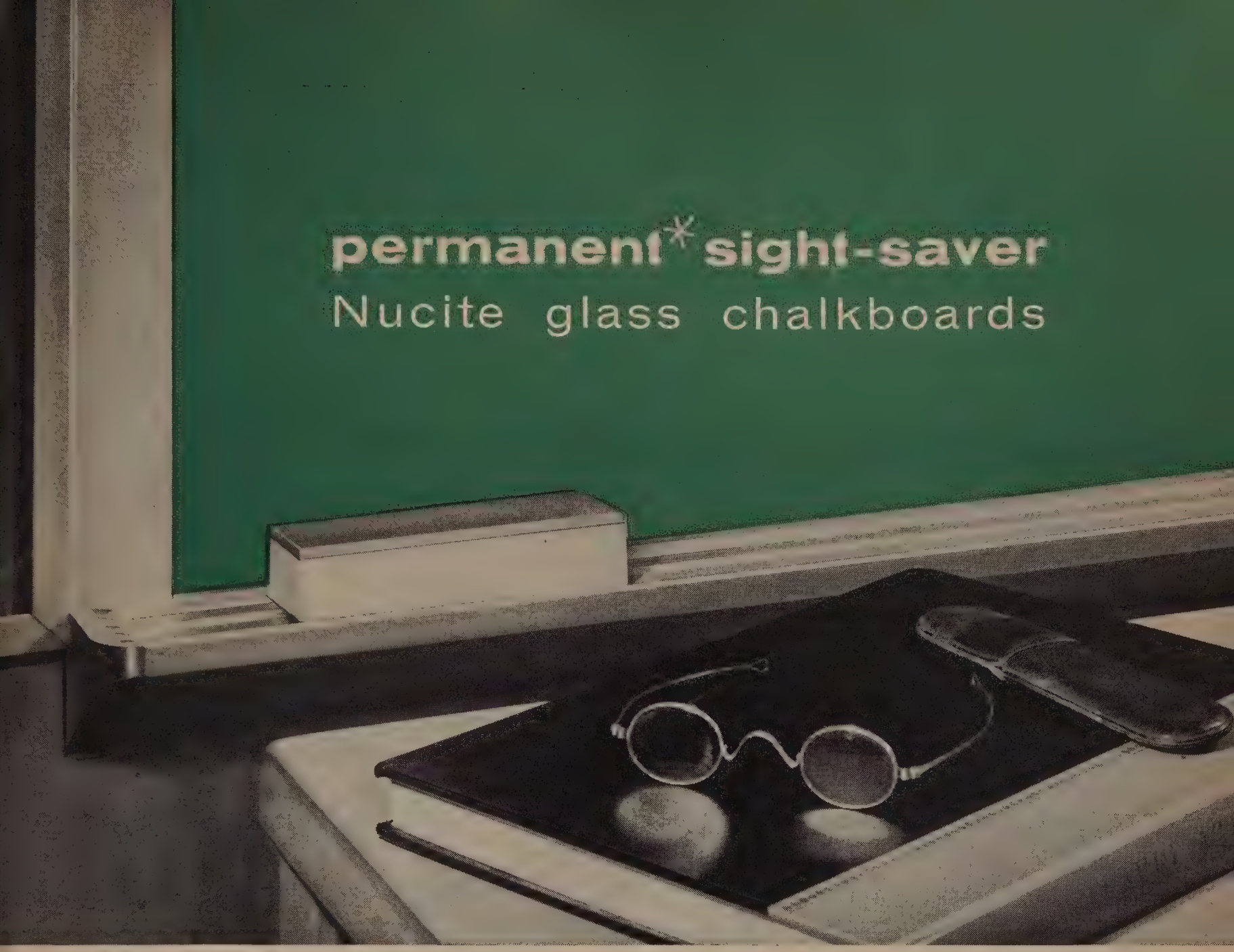
DIXIE
For Medium Floors
Coarse Dirt

PERCHERON
For Rough Floors
All Dirt

BIG MOOSE
For Streets, Drives and Sidewalks

J. I. HOLCOMB MFG. CO., INC. • INDIANAPOLIS 7, INDIANA
Hackensack • Dallas • Los Angeles • Toronto

For additional information, use postcard facing back cover.



The finest writing surface available gives Nucite boards superior legibility

Ceramic enamel studded with aluminum oxide provides the incomparable writing surface of Nucite glass chalkboards. Close grained, it takes an even, smooth mark . . . never permits the chalk to skip . . . washes and erases easily. Installations nearly 20 years old retain their original color and texture . . . continue to provide superior legibility after an estimated 15,000 erasings and frequent washings. Five sight-engineered colors provide optimum contrast with white chalk to give the highest legibility with the least eye strain. Permanently fused to the polished plate glass base, the writing surface never fades, never becomes slick or shiny, never requires resurfacing. And because the glass base is tempered, Nucite chalkboards are highly resistant to damage—they're similar to the porcelain used in curtain wall construction. Yet, installed cost is comparable to that of steel boards. Send for sample . . . or see Sweet's $\frac{23e}{Ne}$ *Agents and distributors in all principal cities. Write for the name of the one nearest you.*

Electrically driven chalk and corkboards are a specialty of the New York Silicate engineering staff. Thayer Hall, West Point, for instance, features three vast motor-driven panels of Nucite chalkboard and Apex cork bulletin board placed one behind the other. Each panel measures 25 x 15 feet. A touch of a button sends any panel up a 30′ vertical track into a storage loft. Raising all three reveals an auditorium-sized motion picture screen. This engineering service is available for consultation in any project. And we are always ready to advise on selection of chalkboards, whether Nucite glass, steel, Formica, composition or slate, and on glass door, swing leaf or changeable letter bulletin boards, since we manufacture them all.

*In more than 20 years and 25,000 installations, we have never been called upon to fulfill the following guarantee: **the surface of Nucite glass chalkboards is guaranteed for the life of the building against fading, warpage, or becoming slick or shiny under normal classroom use.** Should any Nucite glass chalkboard break within 20 years after installation, outside of willful or accidental damage, it will be replaced free of charge.

NEW YORK BOOK SLATE COMPANY, INC.
SILICATE
600 Old Country Road
Garden City, New York

PROGRESSIVE OKLAHOMA SCHOOL DISTRICT SELECTS MATCHING ACCOUNTING EQUIPMENT: BURROUGHS F-1500 ACCOUNTING MACHINE

The scene: Tulsa Public Schools Independent School District #1. **The background:** the largest district in Oklahoma (85 schools). 88½% enrollment increase in 10 years, 15% administrative paper work increase in one year. **The jobs,** assigned to Burroughs data processing equipment: a payroll for 4,600 full and part time employees and all budgetary accounting including detailed financial reports. **The point:** Burroughs equipment has the capacity to automate all your accounting at peak efficiency. Designed for future conversion to punched tape or card, these advanced machines provide today's up-to-date figure-facts for astute control and fund administration. Burroughs—TM

Burroughs automation equipment can help your school or district achieve new levels of accounting productivity. For details, see our new film "This Business of Education." Call our nearby branch. Or write Burroughs Corporation, Detroit 32, Michigan.

Burroughs Corporation

"NEW DIMENSIONS / in electronics and data processing systems"

Impact and fire resistance are twin features of this Polished Misco wire glass installation in the Walt Disney Elementary School, Tullytown, Pa. Architect: John Carver, Philadelphia, Pa.

The New Look in...

SCHOOL DAYLIGHTING

The versatility of Mississippi glass provides the solution to virtually every daylighting problem, including light diffusion and direction, heat absorption, and safety with decoration. And translucent Mississippi glass reduces contrast that results in costly visual errors . . . keeps interiors more comfortable. Occupants see better, feel better, work better. Available at your quality glass distributor in a wide variety of patterns and surface finishes for every daylighting need.

1,050 sq. ft. of Luxlite Coolite, Glare Reduced, installed in southeast elevation of auditorium-cafeteria and classrooms of Stephen Blackhurst Elementary School, St. Charles, Mo. Architect: Bruce F. Barnes, Patterson Mo. General Contractor: Whitworth Engineering Company, St. Louis, Mo. Glazing Contractor: Comfort Distributing Company, St. Louis, Mo.

Maximum light distribution at low cost is achieved by ⅛" Pentecor glass, glazed in vertical sidewall sash in Clopton High School, Clarksville, Mo. Architect: Kenneth E. Wischmeyer, St. Louis, Mo. Glazing Contractor: Rainbow Glass Company.

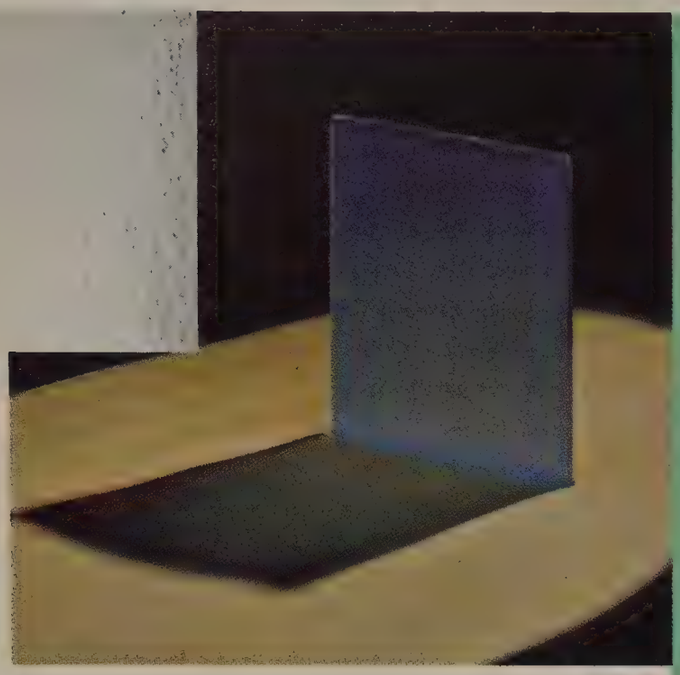
MISSISSIPPI GLASS COMPANY

88 Angelica St. • St. Louis 7, Mo.

NEW YORK • CHICAGO • FULLERTON, CALIFORNIA

Figured glass promotes truly functional architecture adapted to present day needs . . . offers utility, beauty and variety unmatched by any other glazing medium. Specify Mississippi.

PATTERN ACTUAL SIZE



COOLITE

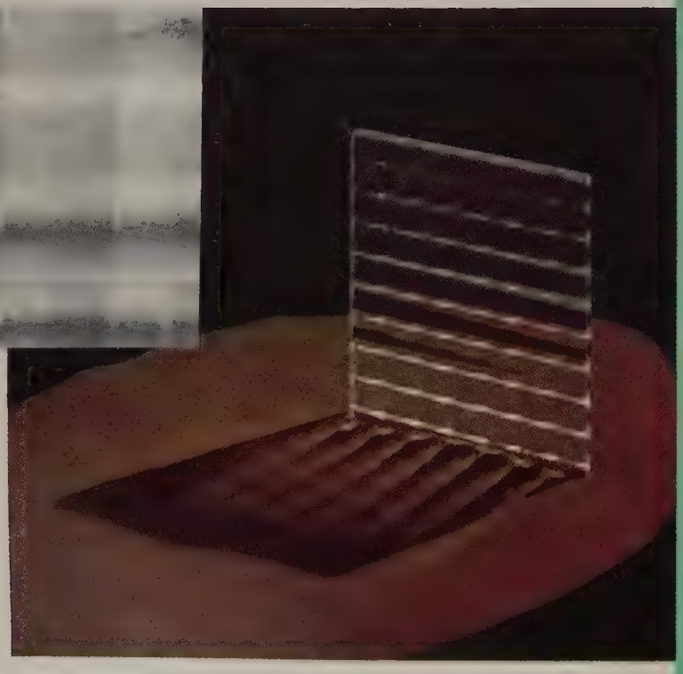
Available in 1/8″, 1/4″ plain and 1/4″ wired, in Luxlite and Hammered patterns. May be glare reduced on either or both surfaces.

PATTERN ACTUAL SIZE

PENTECOR

Available in thicknesses of 1/8″ and 7/32″. Very popular for lighting fixtures and luminaires. Untreated or glare reduced on one or both sides.

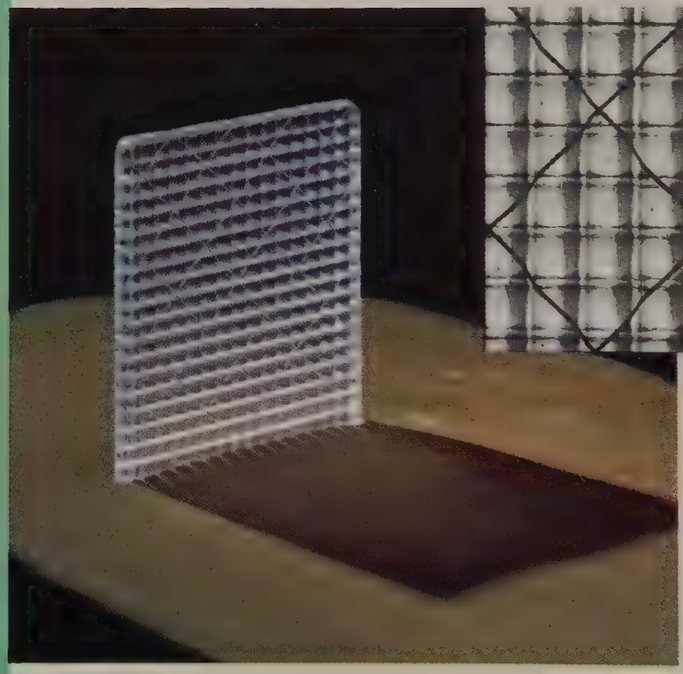
PATTERN ACTUAL SIZE



MAGNALITE A

Furnished in thickness of 7/32″ only. A highly diffusing and very brilliant patterned glass. No special surface treatment available.

PATTERN ACTUAL SIZE



MAGNALITE B

Furnished in thickness of 7/32″ plain and 1/4″ Misco wire. Particularly effective for partitions at eye level. No special surface treatment available.

MISSISSIPPI GLASS COMPANY

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NEW YORK • CHICAGO • FULLERTON, CALIFORNIA

NEW CATALOG

Contains pattern descriptions, light distribution charts, transmission data. Send for your free copy today.

When you plan to build a school

. . . let the application specialist from your local gas company help you, your architect and consulting engineer choose the most efficient system for heating, cooling and ventilating. On the following pages you'll see how modern gas equipment can give your school complete classroom comfort—at reasonable cost.

How your GAS company can

1. The Planning Team Right from the beginning, when you have chosen the architect for your new school, you realize that your project calls for a lot of teamwork—particularly in the design for efficient heating, cooling and ventilating systems.

A great help at this stage . . . for school management, architect and engineer alike . . . is the counsel of your local Gas Company regarding the economy and application of modern gas equipment for these systems.

Heating, cooling and ventilating facilities in many of the largest, most modern schools have been planned with the help of local Gas Companies' application specialists.

You can take advantage of this qualified help by setting up a very effective Planning Team: School Management—Architect—Engineer—Gas Company.

2. The Complexity of Specification Writing Your architect's and engineer's knowledge of specification writing plays a major role in increasing the value of your school and keeping costs at a minimum. But *your* acquaintance with this vital function of school planning can be of assistance to them.

There are four major recognized methods of specifying materials and equipment for new building projects, such as your new school:

a. The "Descriptive" Specification. Materials and equipment are described in detail, but no brands specified. Time may be lost in seeking the exact equipment described, and there is little assurance of quality.

b. The "Flat" Specification. Exact brand is specified. No substitutes allowed. No protection against high costs.

c. The "Open" or "Or Equal" Specification. Several makes are named, or the specification describing the required equipment includes an "or equal" clause. Contractor must submit his lowest bid regardless of quality. Manufacturers may hesitate to bid their lowest prices, since contractor is free to "shop" for even lower prices (to his advantage) after he is awarded the contract.

d. "Base Bid With Alternate." Specific brands are specified for the base bid, but a bidding contractor may propose substitutes. This assures quality and permits alternatives, providing the contractor states in his bid to you the actual deduction or addition. You can then compare price, quality and service of several manufacturers on an equitable basis. *School authorities agree that this is the most acceptable type of specification.*

3. Specifying for Present and Future Needs You may not plan now to operate an all-year school. But this subject is being considered by many school authorities. In fact, an 11- or 12-month school has been tried and is now being used. If there's a possibility your school may change to this system in the future, it would be wise to plan *now* for year 'round heating, cooling and ventilation.

Even your *present* needs may call for an all-year operation, with such activities as summer school programs (including "make-ups" or, in the case of gifted children, "speed-ups") . . . community recreation . . . adult education . . . civic functions . . . or perhaps a community library service. The success of such projects is well worth the investment in facilities for year 'round comfort.

4. Wide Choice of Systems for Year 'Round Comfort The makers of modern gas equipment for year 'round heating, cooling and ventilation offer an unusual variety of systems—designed to meet the needs of every type and size of school, regardless of geographical location. Here are some of the choices:

a. A conventional hot water system using convectors or radiators, usually supplemented with exhaust fans for ventilation.

b. Radiant gas heating used in combination with a ventilating system.

c. A central or zoned system combining heating, cooling and ventilating in the same system of ducts.

help you build a better school

d. A system such as the unit ventilator, using individual heating and ventilating units in the area served.

Each system has its own advantages and limitations which must be considered in the plans for any school. Your Gas Company application specialists can help you and your architect in the selection of the proper system.

Whatever system you choose, with modern gas equipment you can be sure of:

Safe operation
Reliability of equipment
Dependability of energy source
Simplicity of installation, maintenance and operation
Long service life
Cleanliness
Fuel economy
Healthful, ventilated air

5. Year 'Round Gas Air Conditioning More and more school managements agree that an investment in equipment to condition air is worth more when it provides year 'round service. And since gas air conditioning systems deliver heating *and* cooling—using the same basic fuel—they are unusually efficient, economical and space-saving for year 'round operation.

A complete year 'round gas air conditioning system will:

Cool the air in summer
Heat it in winter
Remove excess moisture in summer
Add adequate moisture in winter
Remove stale air and provide effective fresh air ventilation at all times
Remove air-borne dirt
Insure balanced distribution of the air, with temperature thermostatically controlled.

Gas equipment offers complete classroom comfort—regardless of weather or season.

6. Gas—The Economy Fuel For modern year 'round heating and cooling systems, no other fuel matches the long-run economy of gas. Fuel costs—as opposed to first costs—will continue for the life of your school. So they deserve serious consideration in your original planning. As a matter of record, many schools have amortized the first cost of their gas equipment through comparative savings on fuel. Thrifty gas keeps your operating costs down all year, every year.

7. Gas—The Safest Fuel The gas industry has a prime interest in the safety of your pupils. The more than 200,000 people in the gas industry—most of them with children of their own—have seen to the security of each installation.

No other industry in the United States has encouraged such rigid self-regulation to insure the safety of its product in homes and schools. Through the American Gas Association Laboratories, gas equipment is tested to meet the stringent requirements of the American Standards Association. The gas industry has drafted safe installation methods which are practiced by every Gas Company in the country.

Most important, the gas industry has cooperated with municipal authorities to have your building codes reflect the most up-to-date practices regarding the safe installation and safe operation of gas equipment.

8. Gas—For Complete Classroom Comfort All Year Long Your pupils can learn more – your teachers can teach more effectively – in more comfortable surroundings. Let your Gas Company help you and your architect choose the most efficient system for heating, cooling and ventilating. Just call your Gas Company and ask for their Application Specialist.
American Gas Association.

FOR COMPLETE CLASSROOM COMFORT
HEAT AND COOL WITH GAS

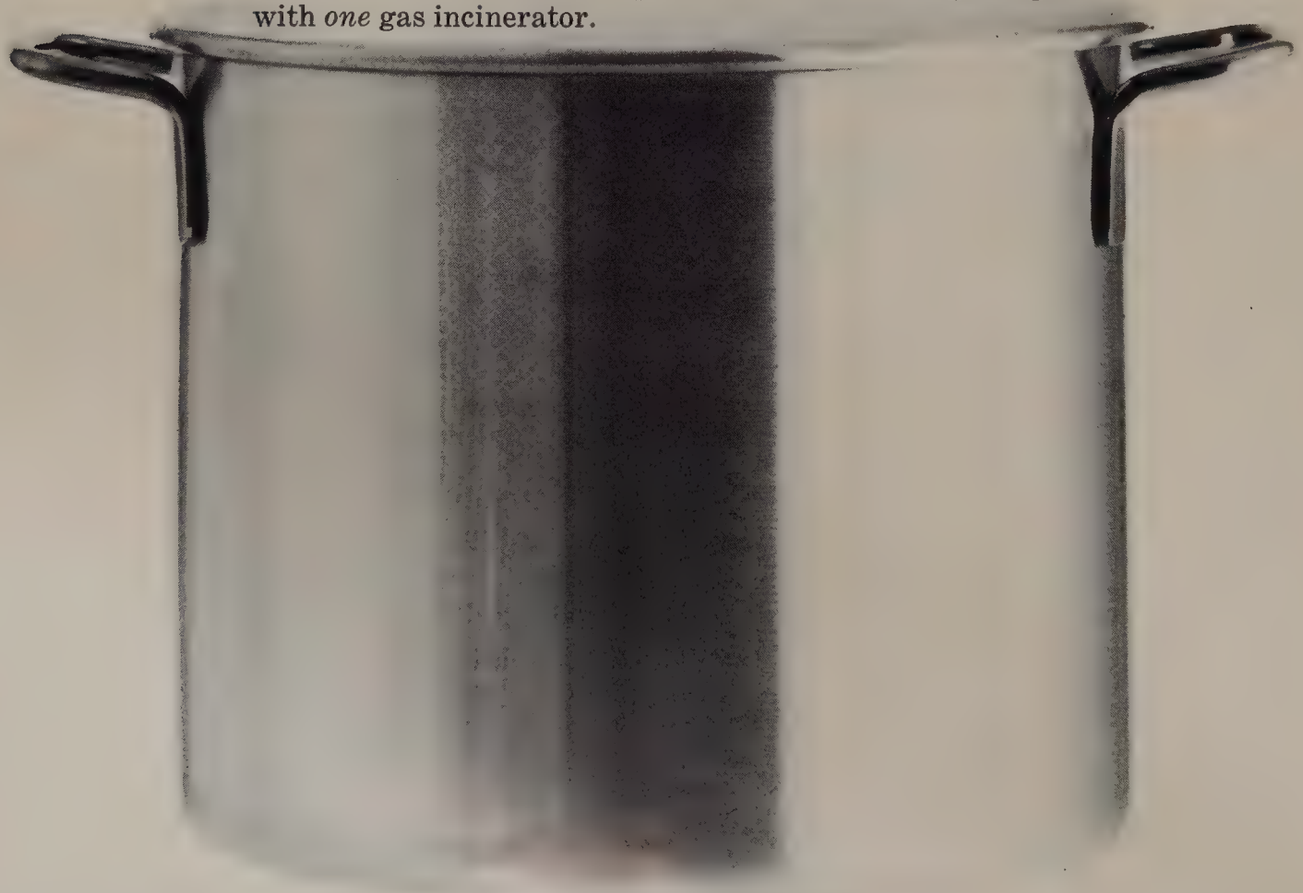
When you plan your school kitchen...

let the Commercial Specialist from your local Gas Company help you, your architect and engineer lay out the most efficient and economical cooking, water heating, and incineration facilities.

For Cooking . . . gas gives your dieticians the dependable, economical operation necessary in running an efficient kitchen. Gas equipment costs less to use and maintain. There is no worry about power failures. Modern stainless steel ranges, ovens, fryers, and broilers are easy to clean . . . and keep clean.

For Water Heating . . . gas gives you the exact two-temperature hot water needed to meet sanitation requirements. You'll always have enough hot water . . . and hot enough . . . with Gas.

For Incineration...many modern schools are finding great advantages in eliminating rubbish storage space by installing gas incinerators. They can be installed externally. No need for refrigerated storage in hot months. Solve two problems with one unit—dispose of *both* trash and garbage with *one* gas incinerator.



FOR KITCHEN EFFICIENCY GAS IS GOOD BUSINESS!

THIS NEW NAME

Thompson Ramo Wooldridge Inc.
EDUCATIONAL ELECTRONICS DIVISION

The benefits to schools and educators of this logical combination are clear. MRI and Dage are pioneers in creating effective teaching tools of utmost simplicity. Both go beyond technological leadership to supply teachers with valuable educational services, based on long experience with installations of every size, purpose and budget. This common pool of information assures you maximum assistance and results, from planning through installation and teaching.

offers the valuable concepts and combined experience of MRI and DAGE in ELECTRONICS FOR EDUCATION

. . . serving your complete needs with QUALITY, EASY-TO-USE EQUIPMENT plus VITAL EDUCATIONAL SERVICES

MAGNETIC RECORDING INDUSTRIES

LANGUAGE LABORATORIES

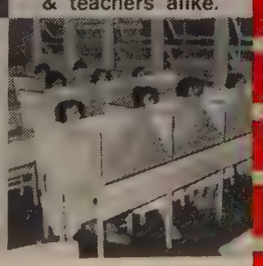
Magnetic Recording Industries The World's Most Complete Line

Typical of MRI's comprehensive leadership are these new advances:

NEW TAPE MAGAZINE. No threading. No mixups. Another MRI development. The first entirely new tape-handling mechanism created exclusively for language teaching.

NEW MAGNETIC DISC. New fidelity. Simplest of all methods. Instant review. Indestructible, reusable over and over again. Ideal for testing [illegible] preferred by students & teachers alike.

NEW FOLD-A-BOOTH. Unified Laboratory-Classroom—another MRI first. Converts from one to the other in a single motion.

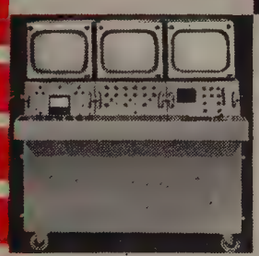


MRI Language Specialists available in your area for consultation. Over a decade of Language Laboratory experience.

DAGE TELEVISION DIVISION

EDUCATIONAL TELEVISION

Broadcast Quality TV for the classroom. Compact, flexible, easy to operate and maintain.



SYSTEM ETS-1:

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VERSATILE—picks up live action, slides, motion picture projection images.

SIMPLE OPERATION—easily mastered by inexperienced operators.

TRANSISTORIZED CAMERA MODEL #334
World's only fully transistorized self-contained broadcast television camera.

Write or phone today for complete information about MRI Language Laboratory and Dage Educational Television Equipment and other educational services.

EDUCATIONAL ELECTRONICS DIVISION

Thompson Ramo Wooldridge Inc.

TRW

A series of helpful manuals and other materials, derived from applications and national seminars, is available. Language laboratory and educational television topics include: "Human Factors," "Planning," "Programming Guide," "Television in Teaching," and many more. Write for complete listing.

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divisions and subsidiaries serving the educational field:
Magnetic Recording Industries Dage Television
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DAGE TELEVISION DIVISION

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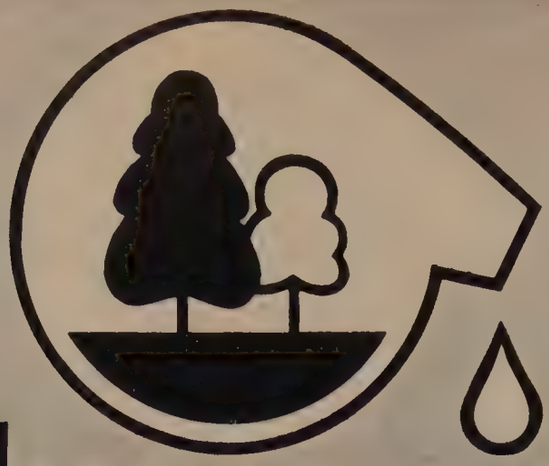

airkem research

*a new dimension in environmental health**

During the past 20 years modern chemistry has brought about tremendous improvements in environmental sanitation. Some of these have been due to the efforts of the world-wide Airkem organization.

As a leader in this movement, Airkem has proved to sanitation administrators time and again that the cleaning and disinfecting of their buildings does not represent a "complete" job.

A "complete" program requires products with an indispensable ingredient. In addition to performing their major function, they must also contribute to the improvement of the overall environment. Every Airkem product does just that. This applies to A-3, Airkem's combination detergent-disinfectant-odor counteractant – Airkem Insecticides–and Airkem Bowl Cleaner. They bring you a healthier environment and also provide a lasting air-freshened effect.

Also, simple, inexpensive equipment can be provided to control odors in the atmosphere and to improve air quality. This can be achieved through your air conditioning systems or by means of attractive portable units.

We would like to demonstrate to you the many benefits of our complete program. Qualified Airkem distributors, located in key marketing centers of the U.S. and Canada, are ready to serve you. Call your local Airkem representative direct, or send your request to John Hulse, Airkem, Inc.

**The World Health Organization defines "health" as, "not only freedom from disease, but the well-being and comfort of the human being."*

airkem FOR A HEALTHIER ENVIRONMENT THROUGH MODERN CHEMISTRY

AIRKEM, INC., DEPT. NS-960, 241 East 44th Street, New York 17, N.Y.

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Thinlite Green Solar-selecting Panels reduce the sun's heat . . . yet let in the light,

and the color's in the glass!

Prefabricated curtain wall panels go up quickly . . . require little maintenance

Now, there's a better way to reduce solar heat gain in classrooms, and improve thermal comfort. The answer is green solar-selecting Thinlite Curtain Wall panels. The cool green color is in the basic glass.

Like all Thinlite prismatic panels, new, green panels reject hot sun rays, distribute light evenly and softly, even to far corners.

And, they add new beauty to school interiors and exteriors.

New, green light-controlling units are but one advantage of Thinlite, the completely weatherproof, thoroughly insulated curtain wall.

For more information about this new light-controlling curtain wall system, write to Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio.

THINLITE CURTAIN WALL
AN (I) PRODUCT

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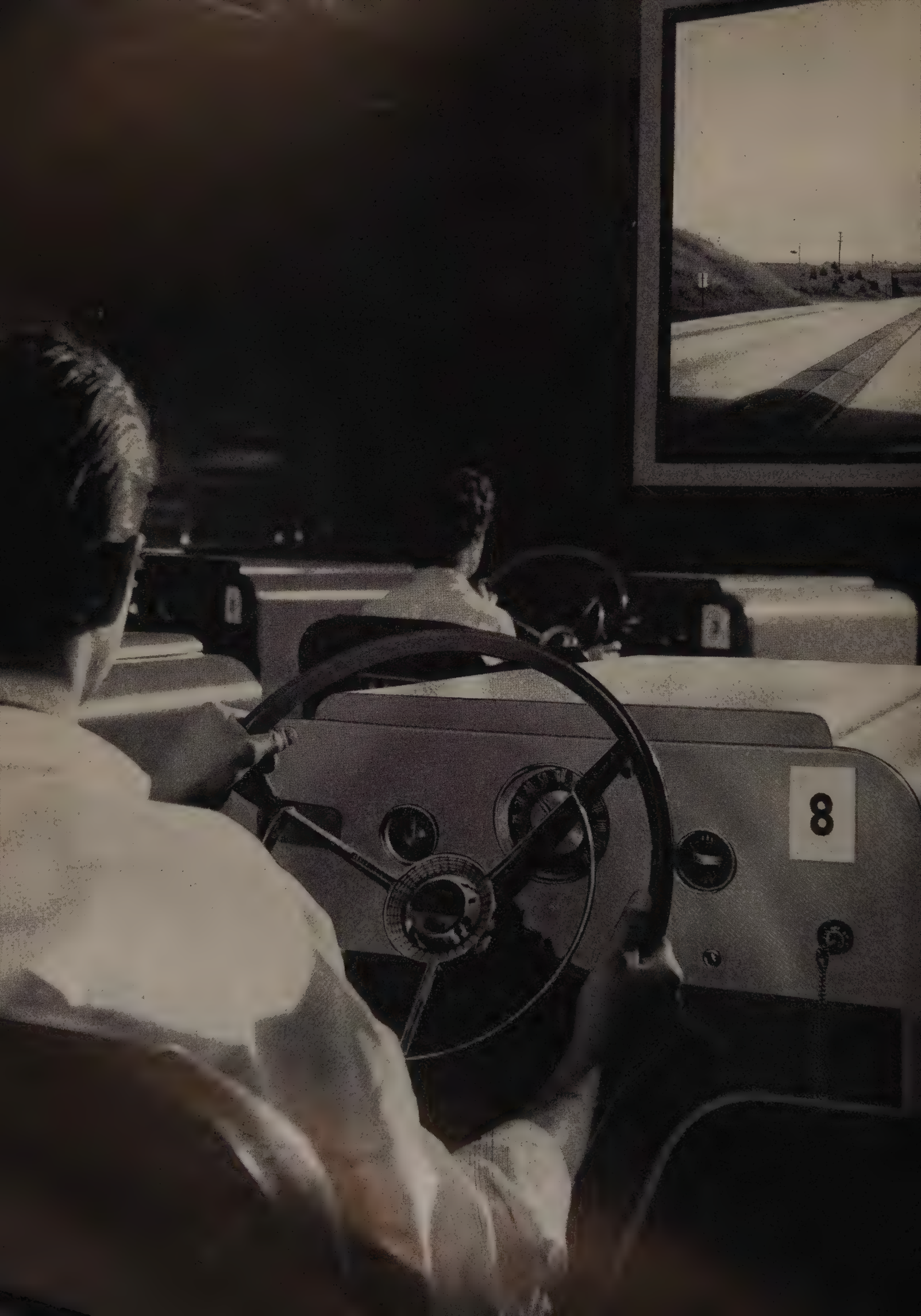
GENERAL OFFICES • TOLEDO 1, OHIO


8

Saves Teachers, Saves Time, Saves Lives

Drivotrainer program dedicated to better driver education in schools

Rockwell Manufacturing Company now extends its service to schools by manufacturing and distributing the Aetna Drivotrainer, the classroom driver training aid developed as a public service by the Aetna Casualty and Surety Company. In developing the Drivotrainer, Aetna called upon nationally known educators for assistance and counsel. Working closely with this panel of experts, Aetna invested considerable time, effort and funds in perfecting the Drivotrainer system of driver education. Now, its classroom effectiveness fully documented by responsible educators, the Drivotrainer is in use in schools from coast to coast.

In producing the Drivotrainer, Rockwell draws upon the same sound engineering and manufacturing skills that have won for Delta Power Tools a place in 72% of U.S. school shops, and that have made Rockwell measurement and control instruments the standards of quality in their fields.

The Drivotrainer permits students to "drive" through all kinds of situations without ever leaving the classroom—and without risk to life or property. Its three chief advantages to schools are:

Better educational values, because Drivotrainer teaches basic driving skills, develops safe driving attitudes and better driving judgment through exposing the student to more traffic situations than he could experience in a similar period of on-the-road training.

Lower per-pupil costs, because Drivotrainer multiplies the number of students that can be taught, *without* increasing the teaching staff, and greatly reduces the number of hours needed for dual control on-the-road instruction.

Higher level of student proficiency, because Drivotrainer drills students to react instantaneously and *correctly* to emergencies —the real test of driving ability.

It is a source of satisfaction to manufacture a product whose ultimate use can only result in safer living for everyone. For further information on the Drivotrainer, write: Rockwell Manufacturing Co., Drivotrainer Division, Dept. 403J, Pittsburgh 8, Pa.

BE SURE TO REGISTER AND VOTE!

◄

Drivotrainer systems similar to the one shown here are in use in schools throughout the country to instruct teen-agers in safe driving. The U.S. Air Force employs the Drivotrainer in the retraining of experienced drivers.

DRIVOTRAINER

another fine product by

ROCKWELL

Easily-installed Random Planks are ¼-inch thick, 4-feet wide and 8-feet long.

fully-finished random-grooved paneling in six exclusive, new Trendwood® finishes

Here's the newest in paneling for beautiful, maintenance-free school interiors. Marlite Random Plank in six distinctive Trendwood finishes will add years of wear with just minutes of care to the walls of your entrances, corridors, classrooms, offices, assembly halls, libraries, kitchens, laboratories, cafeterias, restrooms and other service areas.

Your own maintenance men can install Random Plank over furring strips or existing walls without interrupting school activities. And this melamine plastic-finished paneling needs no painting or further protection. It resists stains and mars for years—cleans in minutes with a damp cloth!

Whether you are planning to build or remodel, investigate Marlite plastic-finished paneling . . . available in a wide variety of sizes, colors, wood, marble, decorator and tile patterns. Your architect, contractor, building materials dealer will give you full details—or write Marlite Division of Masonite Corporation, Dept. 934, Dover, Ohio.

Marlite® *plastic-finished paneling*

6003

MARLITE IS ANOTHER QUALITY PRODUCT OF MASONITE® RESEARCH

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Custom school installations by *St. Charles*

...in Santa Barbara, California

Specified by:

Architects:	Schools:
Chester L. Carjola	San Marcos H. S.
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The beauty of these installations reflects the built-in St. Charles quality that means long-range economy, even under extremely hard usage. And St. Charles' custom-flexibility provides vital design-freedom . . . permitting each installation to meet each individual teaching requirement.

Write for free catalog: "St. Charles Custom School Storage Furniture." Available at request on your letterhead. St. Charles Manufacturing Company, Dept. NSS-9, St. Charles, Illinois

St. Charles
Custom School Storage Furniture

School Storage Furniture for Food, Clothing, Science Labs • Arts & Crafts • Elementary Classrooms

lower SCHOOL BUILDING COSTS—

What does that really mean?

In windows or curtain-walls, it's not just the initial price, but the ultimate over-all costs that must be considered. A quality product is a real economy, eliminating a multitude of hidden expenditures that can be avoided — from the design stage to years of satisfaction and minimum maintenance use. That's why — for lowest building costs — it pays to consult with Bayley and gain these benefits:

- **Ten pre-engineered Curtain-Wall designs, from which you can achieve individualized wall treatments.**
- **Experienced engineering cooperation with your building Designers to avoid drawing revisions and delays.**
- **Elimination of the need for expensive custom designing and fabrication.**
- **Designs that prevent leakage with scientifically positioned weeps and proved sealants in fabrication and erection.**
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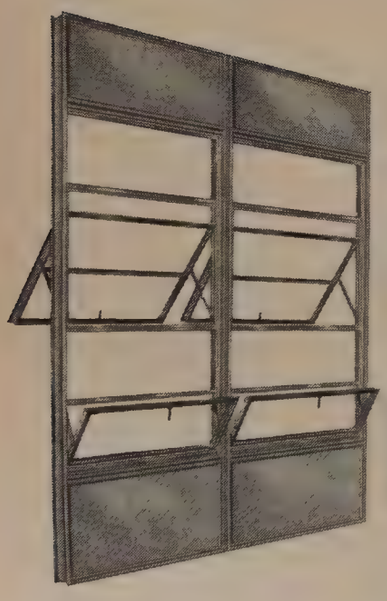
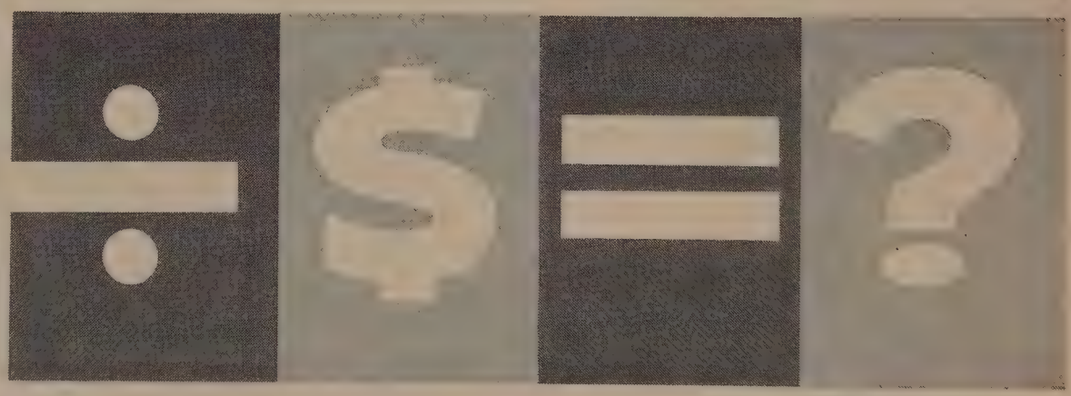
- **Dependability of a recognized, financially responsible organization with complete manufacturing and erection facilities.**
- **Dealings with a company known for recognizing their client-responsibility from a building's inception to its occupancy.**



— and above all, ***A Quality Product!***



If you seek lowest ultimate school building cost, write or call. The nearest Bayley Representative will be glad to cooperate with you.

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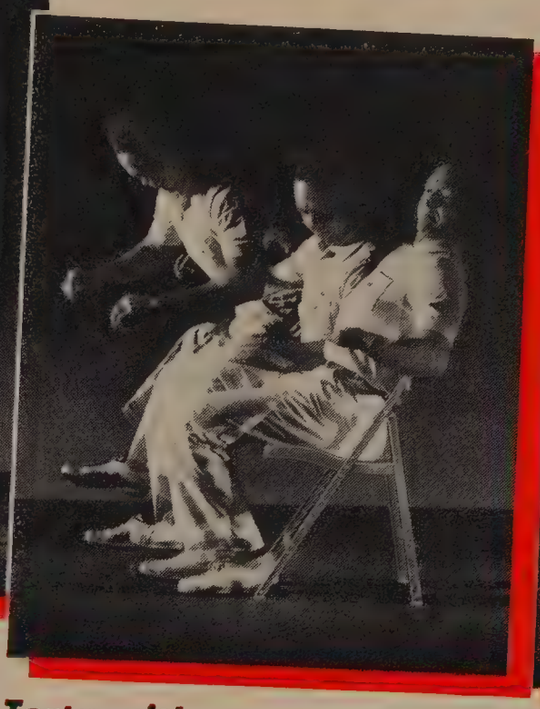
When You're Buying Folding Chairs...

YOU WANT MORE THAN STRENGTH YOU WANT RESILIENT STRENGTH!

THAT MEANS YOU'LL WANT LYON CHAIRS WITH CHANNEL FRAME CONSTRUCTION

Twist it!
Watch how the Lyon chair springs back into perfect alignment. Only channel frame construction gives this kind of resilient strength!



Torture it!
The Lyon chair, with the unusual resilient strength of its channel frame, plus its rugged, angle reinforced seat—is built to absorb shocks and abuse.

Distort it!
Level, comfortable seating, even under the condition shown above—no permanent distortion in channel frame from this extreme test.

The same channel construction that's in your car, *pays off in Folding Chairs, too!*

Automobile builders have used channel frame construction for years. Why? Because it provides *resilient* strength which contributes so much to comfort, safety and long life! For the same reason Lyon offers folding chairs with channel frame construction—assuring you the maximum in comfort, safety, long life and low maintenance cost.

For the ultimate in comfort, seats and backs, designed by seating experts, are curved to match body contour. *For extra safety*, hinges are pinch-proof and all edges are rounded and smooth.

Comparison will prove it—you're ahead with Lyon folding chairs and channel frame construction. *You pay no more—why settle for less?*

A Lyon Dealer is as close to you as your phone. Or mail the coupon for the complete story and our latest 92-page catalog.

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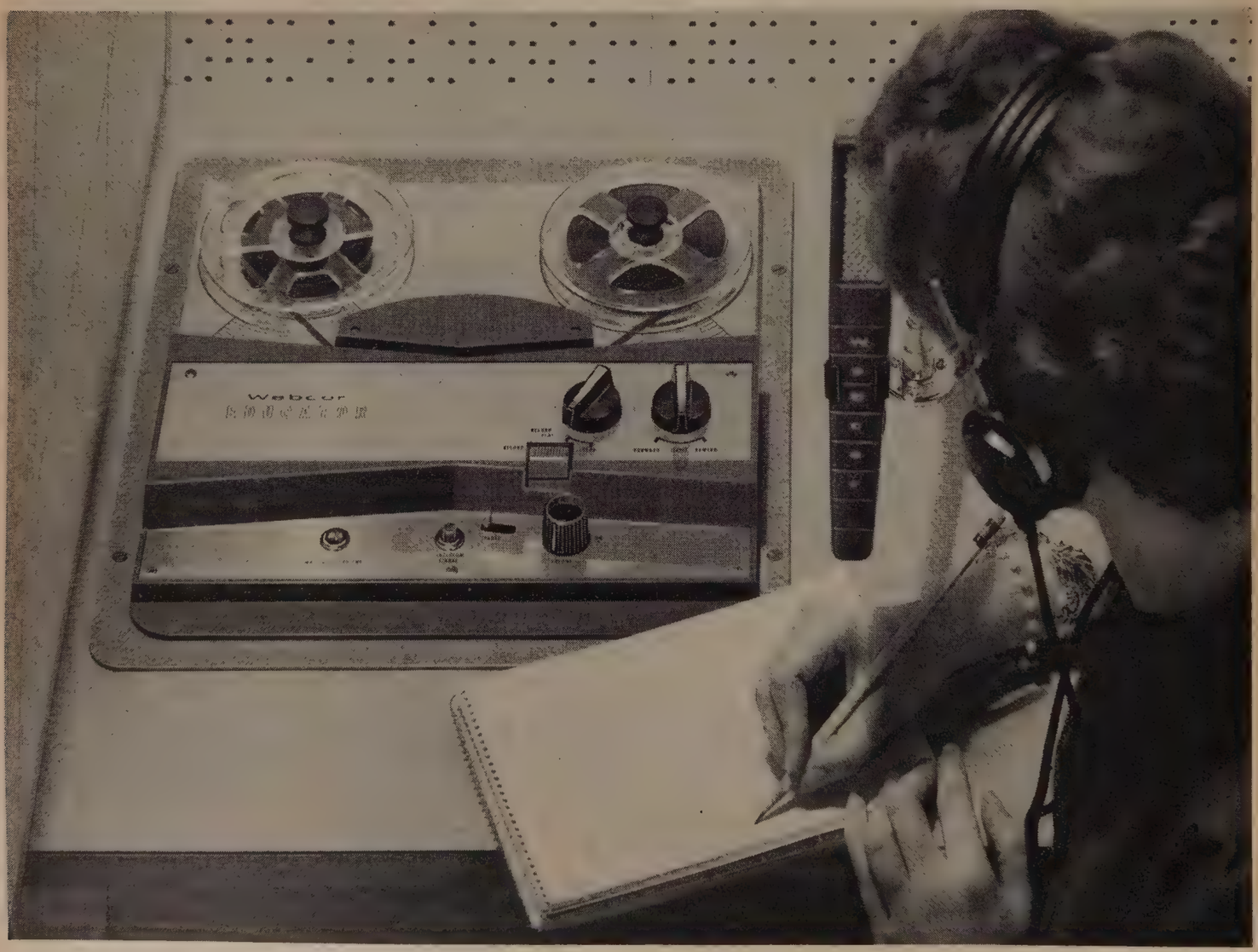
incorporating the design features most wanted by instructors



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- Completely integrated—all student controls on one unit.
- Tamper-proof—all connections below panel top.
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- Automatic Gain Control insures perfect record volume level at all times.

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- Dual track for listen/repeat. 2-way communication.
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- Instructor can monitor any student's work at any time.

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- Specific "classroom" design guarantees against obsolescence.
- Heavy-duty construction for constant classroom use.
- WEBCOR recorders have given reliable classroom service for years.
- Machine pays for itself through long use.

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** Tested with doors by Overly Manufacturing Company*

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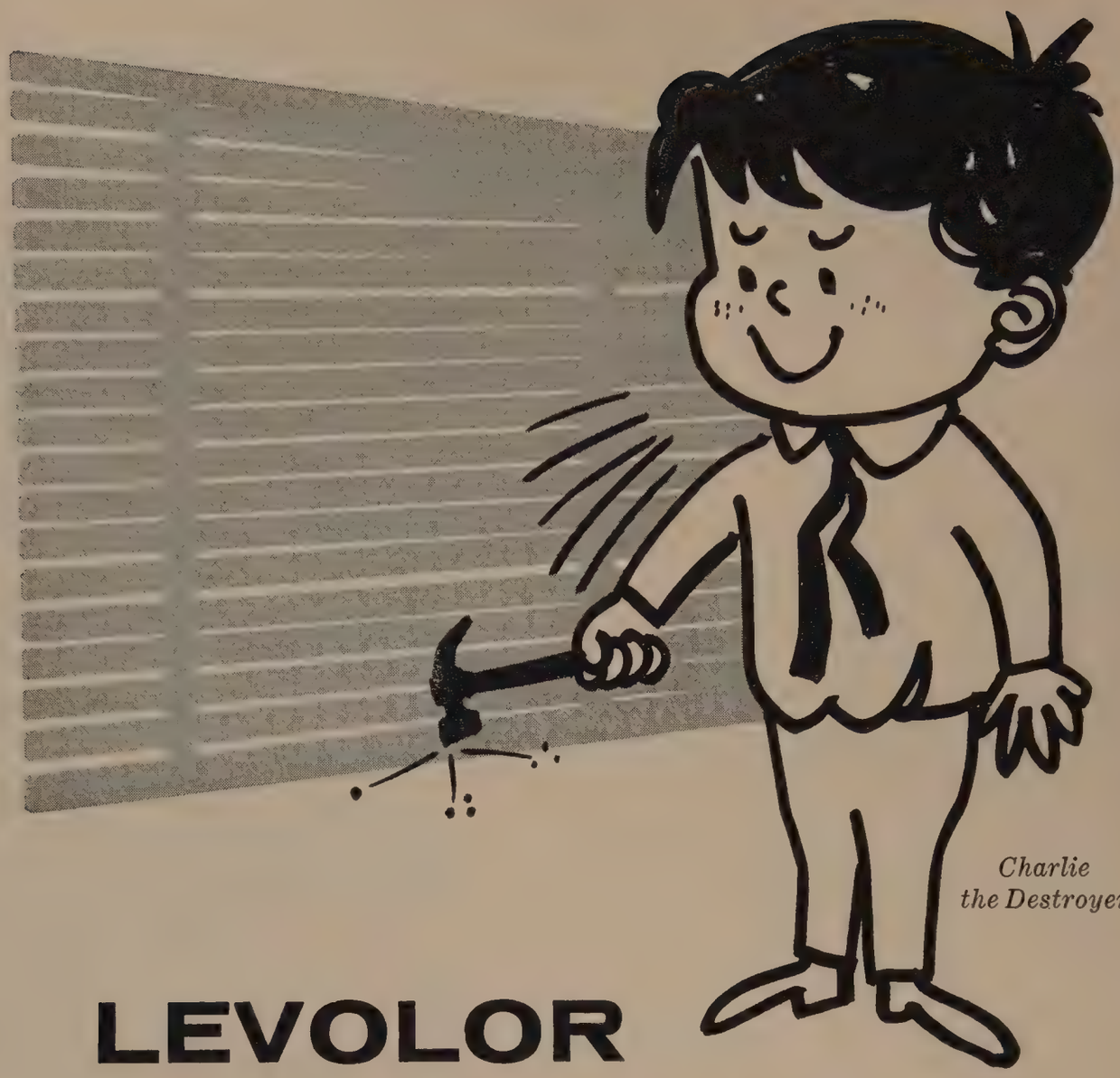

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Information that insures the best installation possible is a service all LEVOLOR representatives will give you. They will submit a prospectus covering every detail of your Venetian Blind installation—help with the specifications and make a final inspection *after* the blinds are installed. It is a service that guarantees good specifications and good Venetian Blinds.

LEVOLOR (TRADE MARK OF LEVOLOR LORENTZEN) VENETIAN BLINDS

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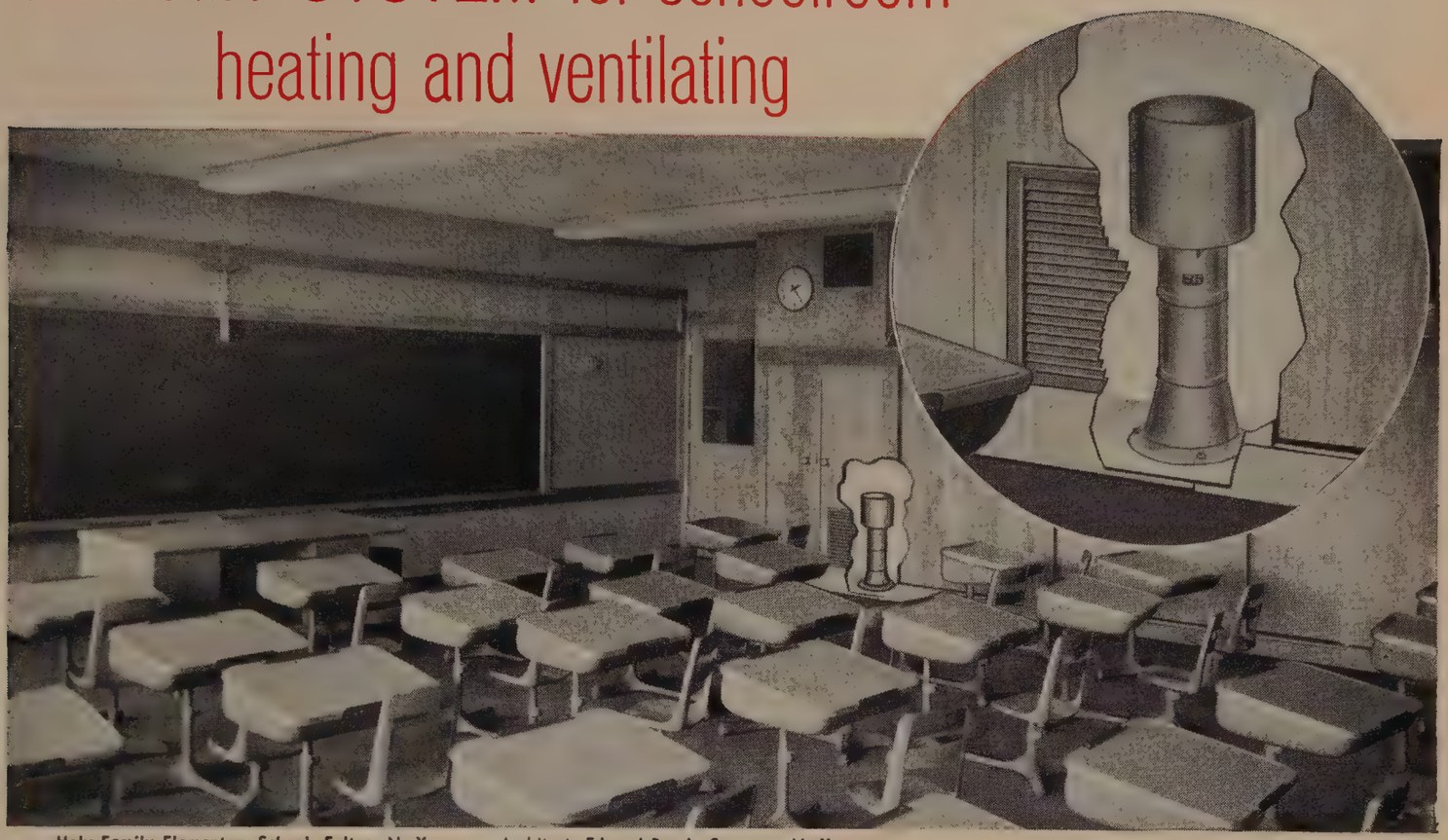
VARI-AIR SYSTEM for schoolroom heating and ventilating



Holy Family Elementary School, Fulton, N. Y.
Pastor: Rev. Edward C. Hearn

Architect: Edward Roock, Syracuse, N. Y.
Contractor: Kenneth A. Taylor, Inc., Syracuse, N. Y.

MECHANICAL INSTALLATION @ $1.36 per sq. ft.

Vari-Air, a "split system" which handles ventilation requirements by a separate Vari-Air unit in each room, combined with Vari-Vac automatic temperature control system, provide a dozen plus features for new schools such as Holy Family Elementary School in Fulton, N.Y.

Foremost is the achievement of satisfying a basic concern of school planners everywhere . . . cost, without elimination of any design requirements. Citing actual facts, not general claims:

1. At Holy Family Elementary School, heating and ventilating cost was $1.36 per sq. ft. compared to 23,520 sq. ft. gross building area cost of $11.59 per sq. ft. This $1.36 figure represents considerably lower installation expense and amounts to a sizable saving on the aggregate.

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2. More free floor area per room.

3. Quick morning heat-up.

4. Designed percentage of fresh air to recirculated air guaranteed regardless of outside temperature change.

5. Complete flexibility of individual room temperature.

6. Elimination of classroom overheating due to student heat gain or sun heat gain.

7. Complete automatic control of heat input to schoolrooms through variation of steam temperature and volume, to agree with outside temperature change demands.

8. No down drafts from cold windows.

9. No drafts from air circulation.

10. No mechanical noise or mechanical maintenance requirements in schoolrooms.

11. Lower decorating costs through slight pressurization of buildings.

12. No technical training of maintenance personnel necessary.

Vari-Vac and Vari-Air systems, manufactured by Dunham-Bush, illustrate the advantages of a single source and delegating a single manufacturer responsibility. For instance, Dunham-Bush products at Holy Family Elementary School include: Vari-Air units; Radiation; Duplex Vacuum Pump with Differential controllers; air handling unit; Vari-Vac temperature controls; Steam Specialties including float and thermostatic traps, strainers, oriflex valves, and orifice plates.

If you're planning a new school or modernization, write for full details on Vari-Air and Vari-Vac.

Only Dunham-Bush can give you the advantages of a Vari-Air system.

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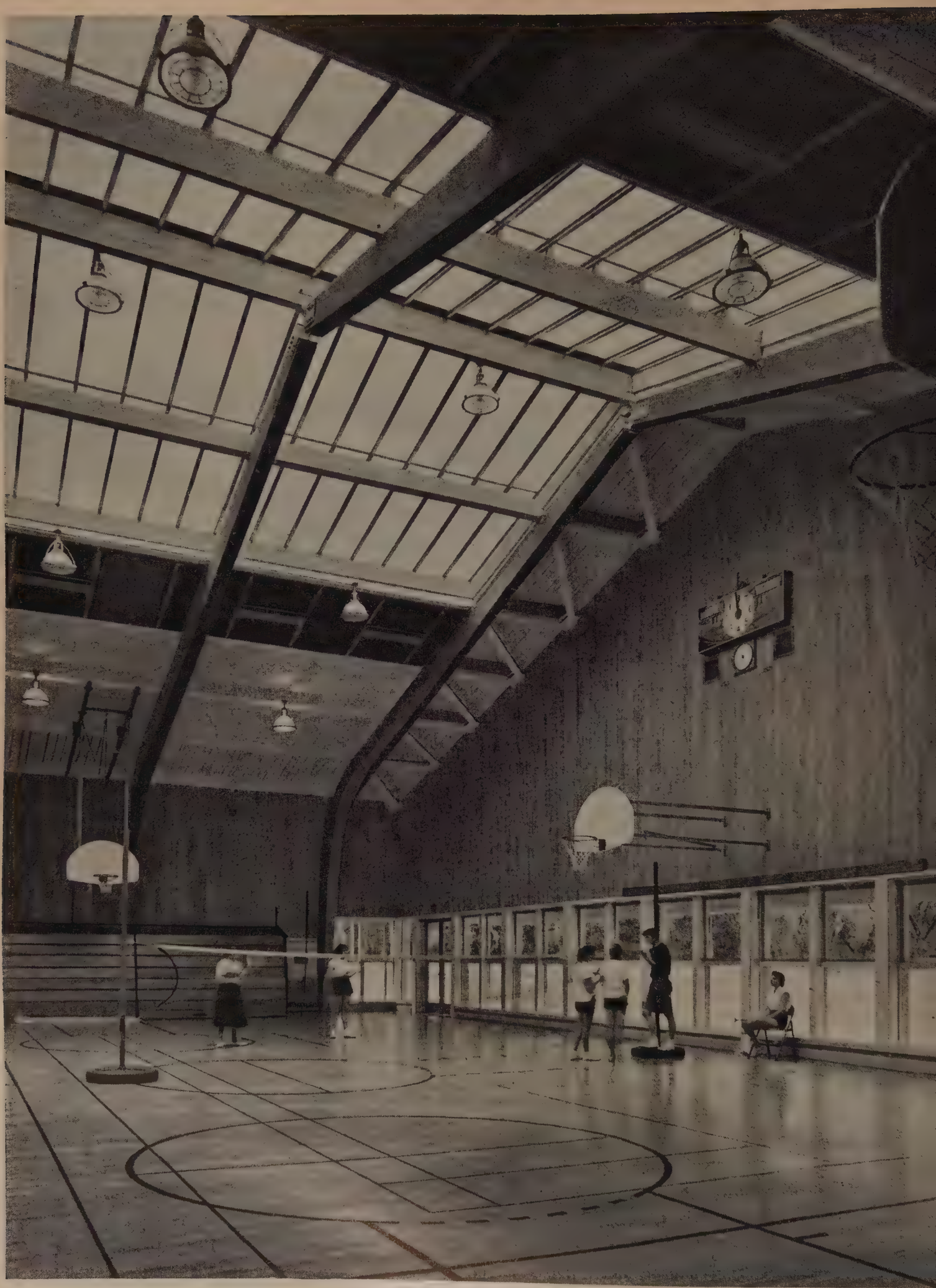

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Background for better schooling:

the welcome warmth of WOOD

Again this year, more and more children are moving happily into new one-story schools of wood. And every new wood school is helping to improve America's *environment for learning*.

In classrooms, wood imparts its familiar warmth to both students and teachers . . . lets them feel more relaxed, more receptive, more at home. In auditoriums, gymnasiums, cafeterias and corridors, wood responds to the most inspired design, the most modern construction. Inside and out, wood obviates the institutional look that can make a school cold and impersonal.

Distinction without frills . . . lower initial cost . . . lower annual cost. These other advantages of wood are as welcome to school planners as its educational environment. The more wood you use in a school, the more *good* school you build for each tax dollar.

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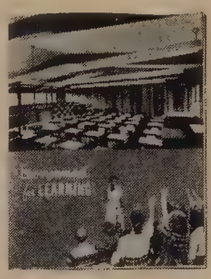
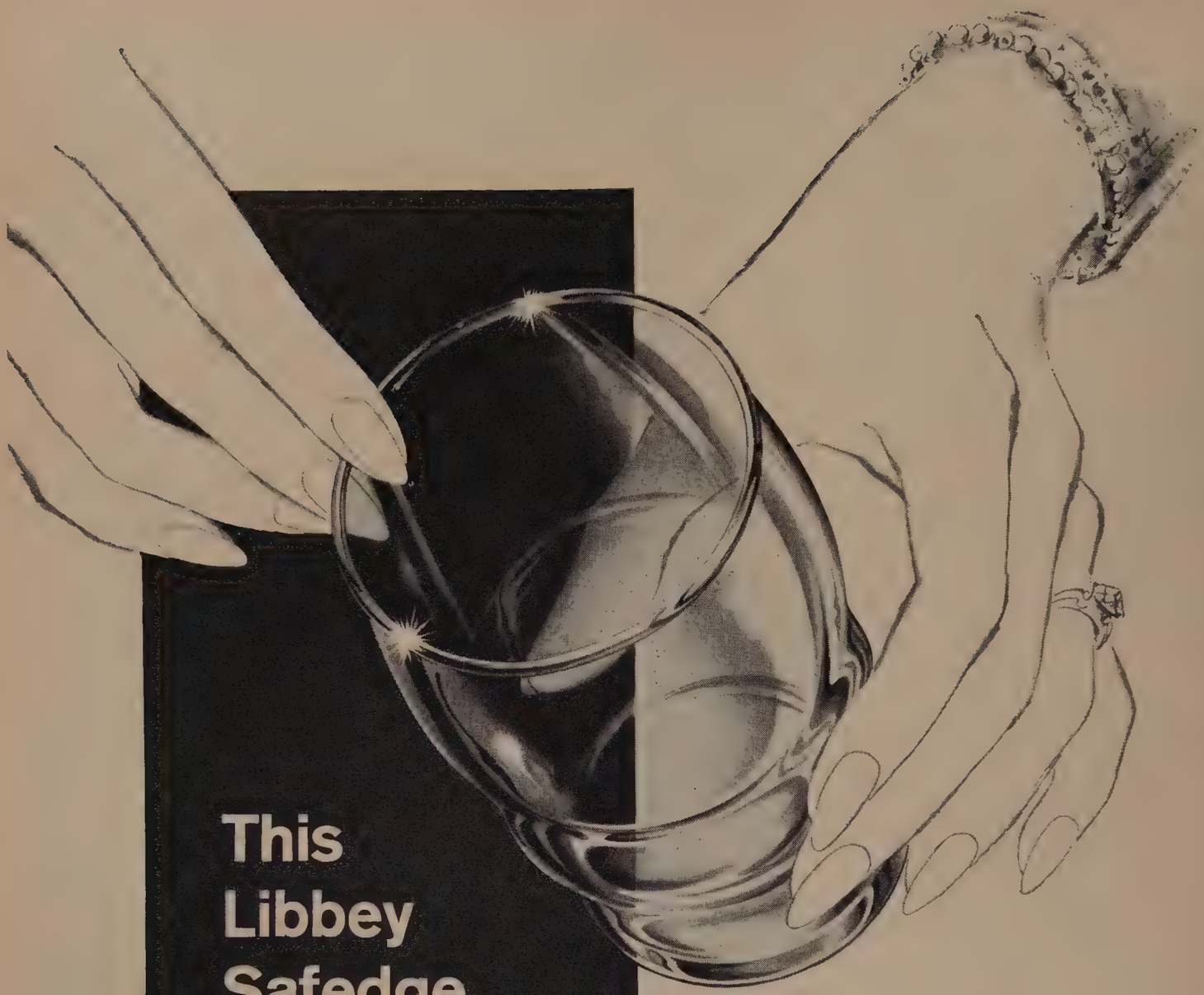
Wood Information Center, 1319 18th St., N.W. Washington 6, D.C.

Live, Work, Build Better with **nlma wood**

This informative new booklet, "*Environment for Learning*," contains comprehensive data on the use of wood in schools. For your free copy (or copies), write to N L M A at the address shown.



San Lorenzo Valley High School, Felton, California. Reid, Rockwell, Bonwell and Taries, architects.



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To prove that this now-famous "Safedge" was as good as claimed, Libbey backed it with the most dramatic guarantee in glass history:

"If any Safedge® glassware becomes chipped on the rim from *any cause whatsoever,* it will be replaced free of cost."

This offer, of course, still stands!

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For full information on how this durable and attractive glassware can serve *your* needs, see your Libbey Supply Dealer, or write Libbey Glass, Division of Owens-Illinois, Toledo 1, Ohio.

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Auditorium of Hannah Penn Junior High School, York, Pennsylvania. Architect: Buchart Associates, York, Pennsylvania. Contractor: . Reindollar & Son, York.

Space provided: auditorium seating 850 people; band room; choral room; four practice rooms; instrument storage; uniform storage; lobby with ticket booth; corridors; general storage. *Structural framing:* glulam buttressed arches spaced radially at 22½°. *Exterior walls:* brick. *Interior walls:* concrete block, brick, wood and acoustical paneling. *Floors:* concrete with asphalt tile in aisles and individual rooms. *Roof:* aluminum battens. *Heating and ventilating:* gas-fired unit ventilators with exhausts on the roof. *Lighting:* bullet-type down lighting in main auditorium; fluorescent fixtures in band and choral rooms; incandescent fixtures in lobby and corridors. *Volume:* 197,963 cubic feet. *Area:* 15,837 square feet. *Cost:* $15.82 a square foot.

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as in thousands of buildings
throughout the nation, glued laminated timber arches
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Keysort, in fact, is the only data processing system flexible enough to fit your school as it stands *and* as it grows. It is the one system adaptable and affordable to schools of every size.

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Your nearby Royal McBee Data Processing Systems Representative has had a wealth of experience in solving school scheduling and reporting problems. Working with you and your board, he can offer helpful advice about a low-cost Keysort system tailored to your individual requirements. Call him, or write us at Port Chester, New York—and we will be happy to supply you with actual case histories from our files.

ROYAL McBEE . *data processing division*

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The individual Study-Center**, the newest and finest school desk in the world, gives students a lift for life. Yet a Study-Center costs less than a penny a week more than ordinary furniture.

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So don't *you* let less than a penny a week stand in their way. Please turn the page.

*by actual records. **T.M. ASCo.

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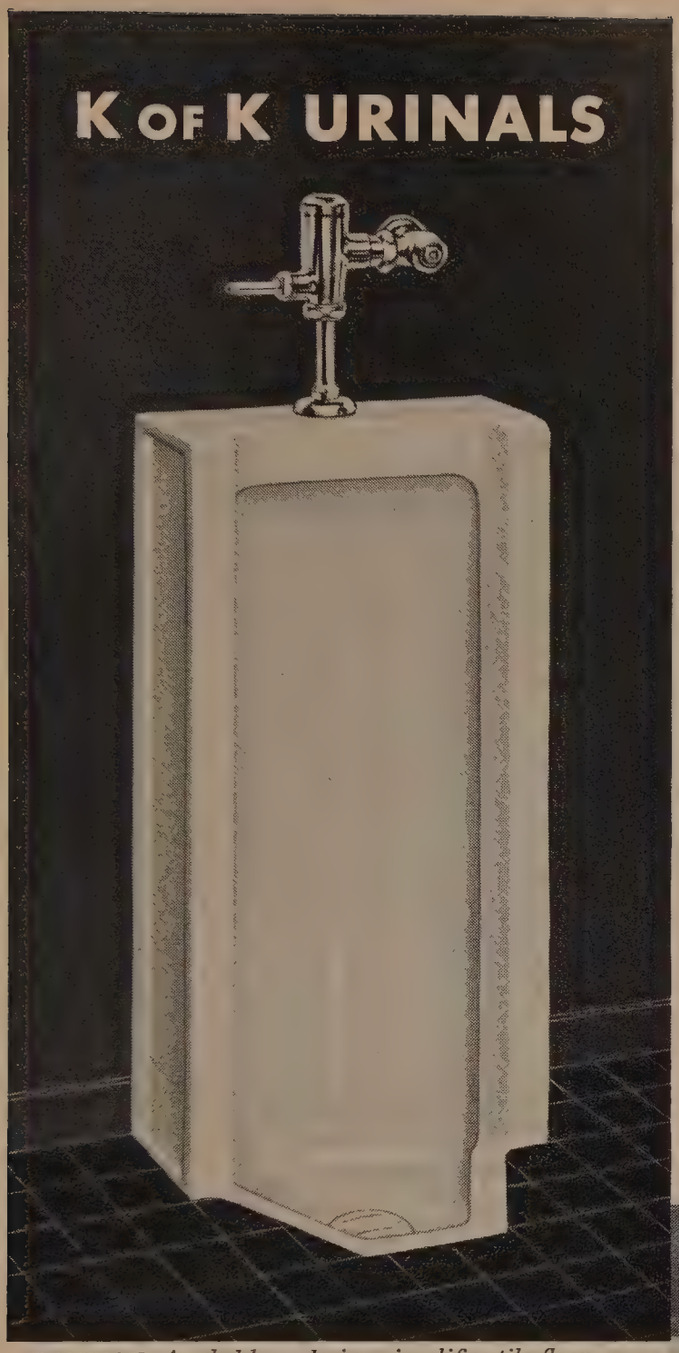

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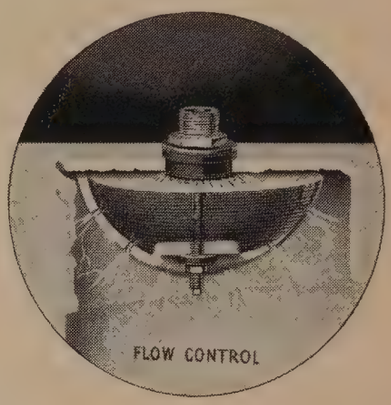
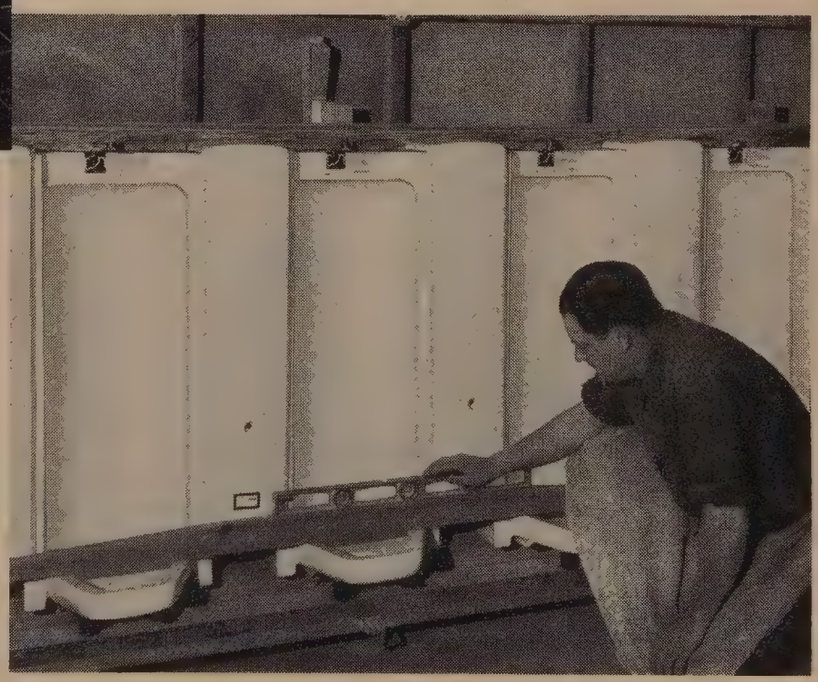
Design and construction features of K of K vitreous china urinals make them easier to install, provide superior sanitation, and reduce maintenance to a minimum.

Exclusive Flow Control



Delivers a positive, cleansing flush to a single urinal or a battery. Insures uniform distribution of water to *all* battery units. Prevents spraying of water beyond urinal. Accessible for easy adjustment. A feature of the Branham stall urinal, and Bardon and Stanwell, wall-hanging types.

Pre-assembly at factory



Each battery of Branham urinals is pre-assembled and checked for uniform dimensions, to assure level floor line and neat appearance.

Seam covers are also pre-assembled, ground where necessary for perfect fit, and labeled to show reassembly locations. Available for urinals mounted at 21″ or 24″ center spacing, with permissible variations of one inch, plus or minus.

Use of K of K seam covers eliminates need for filling spaces with scrap plaster and cement, which may contract and cause cracks.

KOHLER CO. Established 1873 KOHLER, WIS.

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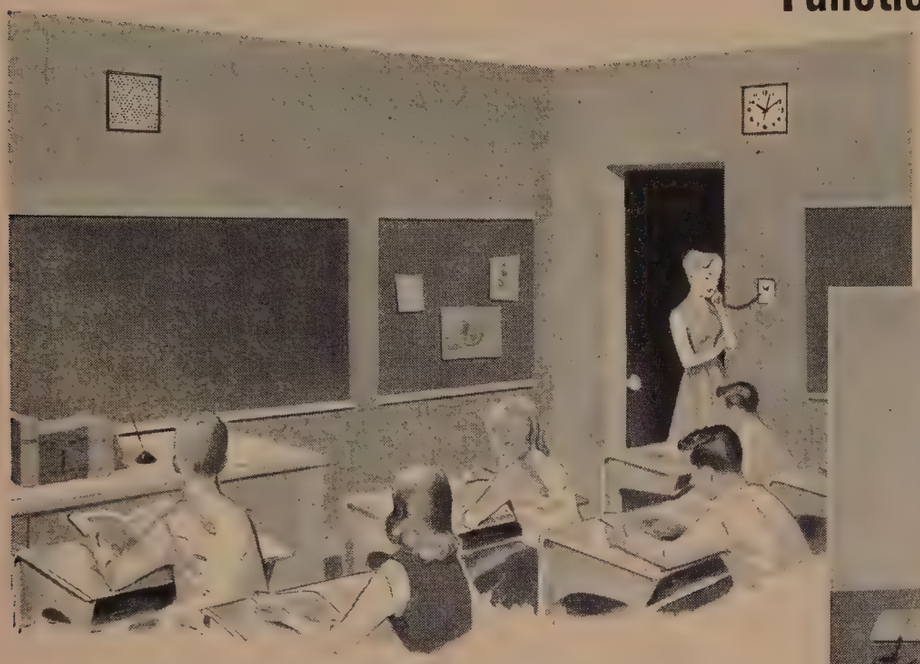
ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS • ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

NEW for Schools...

PRACTI-CALL® ... the practical, all-purpose communication system

"Functionalism without Frills"



Telephone permits private, two-way communication.
Wall speaker provides for general announcements, special events, emergency instructions, etc.
Wiring is in same conduit as clock and program system.

PRACTI-CALL system is incorporated as part of clock and program system . . . utilizes same conduit, existing bell control board (background) . . . is operated by office secretary.

Here at last is an *economical, sensible* communication system designed especially for schools. PRACTI-CALL fills *all* school communication needs:

1. General announcements, news, special events, emergency instructions, etc. are communicated to all classrooms simultaneously through an "all call" speaker system.
2. Conversations requiring privacy (approximately 90% of all intra-school communication) are carried on over a private telephone system.

With all its flexibility of use . . . an adaptability never before available . . . PRACTI-CALL costs *substantially less.* No bulky, high cost console . . . no intricate mechanisms to go awry.

IMPRESSIVE INSTALLATION SAVINGS—All basic wiring runs in the *same conduit* as the school's clock and program system . . . effecting additional important savings on installation.

PIN-POINTED RESPONSIBILITY—Service, whether on clock and program system or communication system, is from a *single source* when PRACTI-CALL is specified with a STANDARD program system.

Request Bulletin No. 248 containing complete information and specifications.

STANDARD TRADEMARK Time

THE STANDARD ELECTRIC TIME COMPANY

89 LOGAN STREET • SPRINGFIELD, MASSACHUSETTS

...AMAZING NEW ZEPROTEX

the waxless finish, protects your floors

With Zeprotex you get all of the advantages of wax, none of its disadvantages:

- A hard, clear, wear and water resistant surface that outlasts wax many times!
- Completely non-slip rain or shine.
- Easy application that dries to a brilliant gloss even without buffing.
- No ammonia odor . . . no streaking . . . no overlap marks on touch-ups.
- A deep down gloss that enhances floor beauty and never darkens or discolors, even on light floor colors.

ZEPROTEX is the ideal finish for any floor, particularly where non-slip safety is crucial. It is made from new emulsifiable plastics and resin polymers blended into a water emulsion that is safe to use on all surfaces. Its hard, self-healing film is highly resistant to wear, scuffing and water spotting, yet it *can be easily removed when necessary!* ZEPROTEX is already complimenting and preserving many of America's most beautiful floors . . . it can do the same for yours!

For a FREE demonstration of ZEPROTEX send the coupon below today!

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We would like a FREE demonstration of new Zeprotex.

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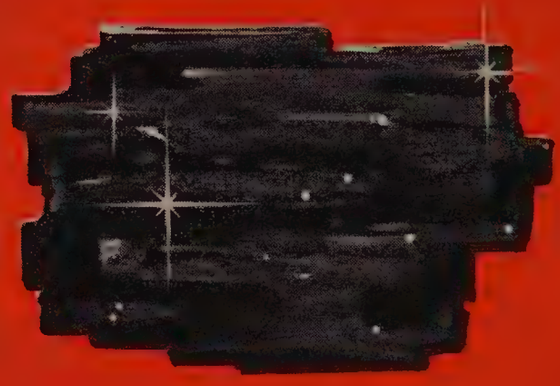
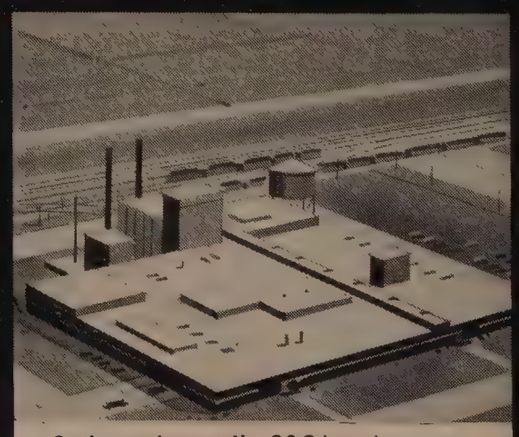




Coal operators on the C&O have done a revolutionary job of modernizing, in both mines and preparation plants to economically produce high quality coals. These investments prove coal is the fuel of the future.

ER COAL!

COAL IS RELIABLE for the constant production of steam for process and power

For over a century and a half, since the harnessing of steam, industrial America has been dependent upon coal for conversion to dynamic energy. Today, coal is still preferred by informed users in major industrial areas who count on its economy, efficiency and reliability.

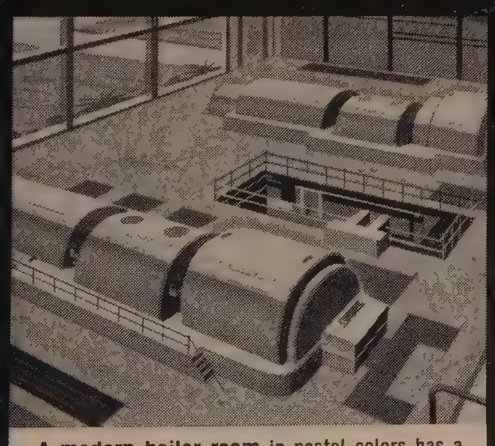
Reliable—because coal's tremendous reserves assure abundant supply for *centuries, not decades.* More efficient and economical than ever before—benefits of constantly new technological developments in both the mining and use of coal. Reliability, too, in transportation of coal by Chesapeake & Ohio—and at low cost.

It will pay anyone faced with the problem of modernization to *rediscover coal.* Today or centuries from now there will be ample supply to outlive the life span of the finest combustion equipment.

Chesapeake and Ohio Railway

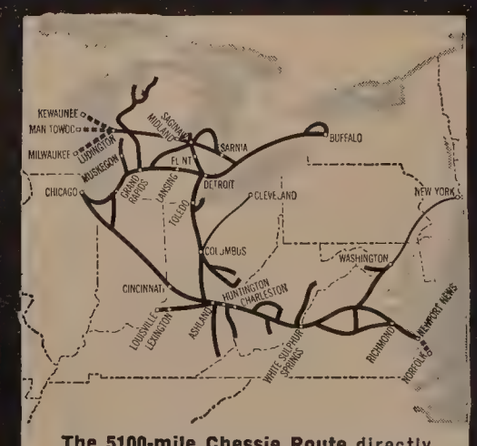
Terminal Tower • Cleveland 1, Ohio

Outstandability in Transportation



A modern boiler room in pastel colors has a clean, almost clinical appearance. Automatic sealed handling of coal and ash eliminates dust. Advance-design combustion equipment gets top BTU's from low cost coal.

C&O Fuel Service Engineers provide free consultation to C&O patrons on combustion, application, equipment, or plant arrangement problems. Write to R. C. Riedinger, General Coal Traffic Manager, above address.



The 5100-mile Chessie Route directly serves over 300 mines in America's richest bituminous coal reservoir with the finest fleet of 68,000 coal cars. Specify C&O routing for dependable, efficient delivery.

CHESSIE SERVES THE COAL BIN OF THE WORLD

How Imaginative Engineering Provided Air Conditioning To Fit A School Budget

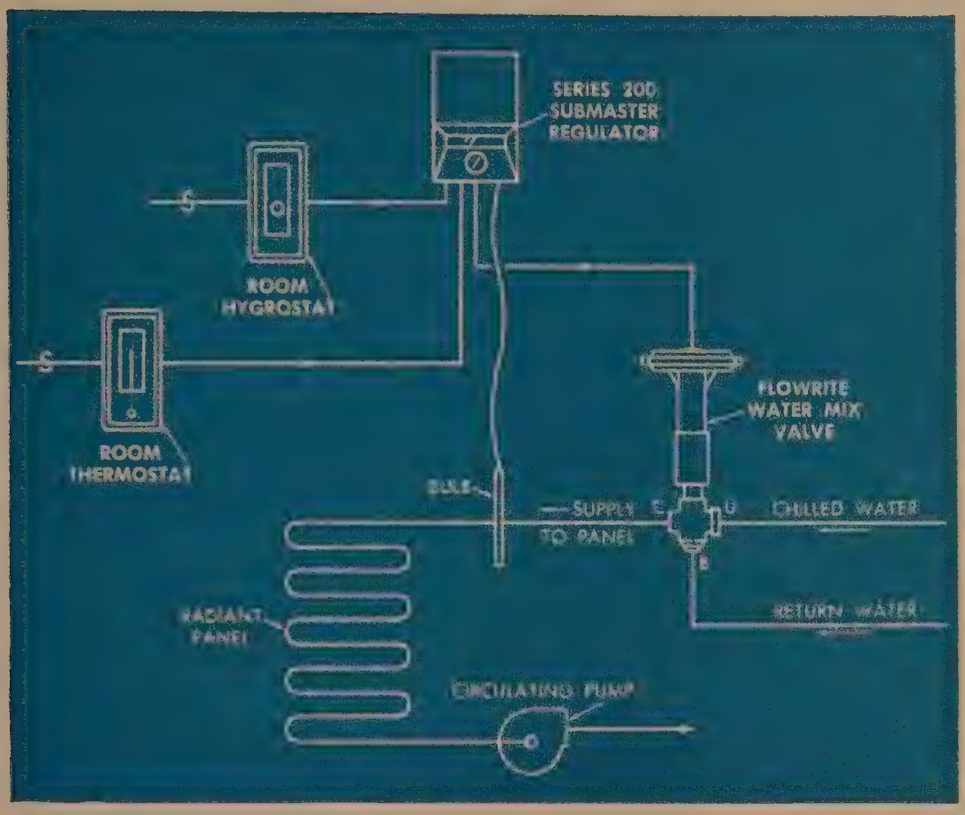
Must school air conditioning always be "too expensive"? Perkins & Will, Chicago architects and engineers, didn't think so last year when they designed suburban Homewood-Flossmoor High School. Without exceeding the school budget, they provided an air conditioned area large enough for complete summer sessions, including 15 classrooms, the library and all administrative offices. Actually, cooling for 25,000 square feet added less than 3½% to normal building cost — less than $4 per square foot of cooled area.

Homewood-Flossmoor High School, Flossmoor, Illinois. Air conditioned section (center) connects to other school facilities by glass-enclosed passageways.
Architects and Engineers: PERKINS & WILL, CHICAGO
Mechanical Contractor: THE ECONOMY PLUMBING AND HEATING CO. OF CHICAGO.

Perkins & Will team of architects and engineers works out details of the cooling system design features and controls for the Homewood-Flossmoor school. From left to right are F. Philip Brotherton, Designer and Project Architect; Rudolph J. Houkal, Chief Mechanical Engineer, and Edward C. Colin, Chief Structural Engineer.

How it was done

Perkins & Will grouped all rooms where both heating and cooling were desired into one section of the school. An interesting design feature is the core of 15 classrooms, surrounded on all sides by other rooms. The fuel savings realized from this "insulated" core help defray the added expense of cooling the entire summer school section. The engineers concentrated all mechanical service equipment beneath this section to eliminate long air conditioning channels. Double ducts and automatic controls were carefully designed for easy switchover to cooling and to take full advantage of tempered return air and outside air during spring and fall seasons.

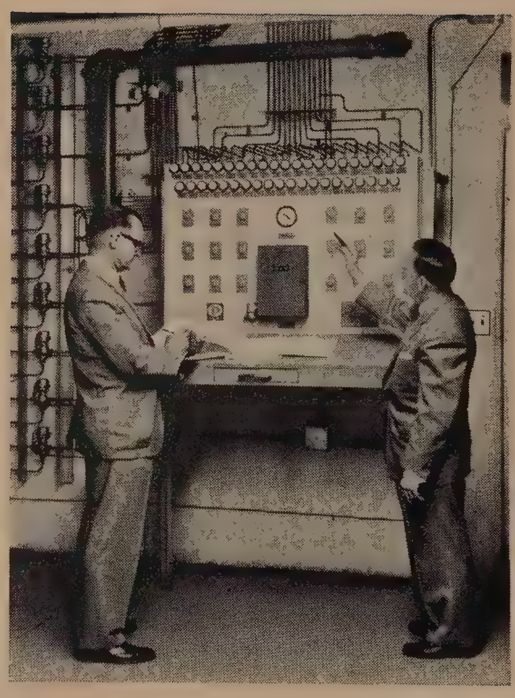


Ceiling Panel Condensation Control

To back up the mechanical efficiency it so carefully designed into the heating, cooling and ventilating system, the Perkins & Will firm specified a Powers system of pneumatic temperature control, including the important dew point control which acts on the chilled water auxiliary cooling used in rooms exposed to the outside. This control (see diagram) utilizes a Powers Water Mix Valve on the ceiling panel chilled water supply and a low limit Submaster Regulator. The Powers Hygrostat measures room humidity conditions and resets the low limit temperature to prevent condensation on panel surfaces, yet allows supply water temperature to be as low as possible for maximum cooling.

Fuel savings in all zones, including those not cooled, are maintained with Powers Day-Night zone controls. A 7-day program clock on the master control panel in the boiler room provides easy switching from day cycle to night cycle. This Powers pneumatic control panel automatically provides a 24-hour-a-day picture of temperature levels in all zones.

Write for the latest Powers Catalog of efficient, economical pneumatic controls for schools and other structures.



Homewood-Flossmoor Maintenance Superintendent William C. Drews (left), takes readings from the automatic Powers pneumatic control panel.

THE POWERS REGULATOR COMPANY
DEPT. 960, SKOKIE 7, ILLINOIS
Offices in Principal Cities in U.S.A. and Canada
MANUFACTURERS OF THERMOSTATIC CONTROLS SINCE 1891

You name it . . . if it's washable, FORWARD will clean it better

Better than harsh abrasive cleaners . . . better than the so-called neutral cleaners . . . better, in fact, than any cleaner you have ever used—on grimy equipment, on greasy walls, on dirt-embedded floors . . . on any washable surface.

We know because we have tested it against all the leading maintenance cleaners . . . because we have seen it with our own eyes . . . and because people who try it tell us so.

FACT: FORWARD ends power fade-out. FORWARD keeps on cleaning long after other cleaners are exhausted. **FACT:** FORWARD cleans the worst imaginable grease, grit and grime on any surface that's washable. **FACT:** FORWARD makes cleaning easier . . . not easy, but easier—saves you time . . . work . . . expense. Get FORWARD. Try it. See for yourself.

From **JOHNSON'S WAX** Service Products Division . . . Products with the Big Difference. FORWARD—the Cleaner That Ends Power Fade-out. FORWARD is a registered trademark of S. C. Johnson & Son, Inc., Racine, Wis.

For the administrative offices

Announcing the *4000 Line by All-Steel

Architecturally styled for the schools of today in a choice of pleasing, cheerful finishes. The 4000 Line is so complete in styles and sizes that you are limited only by your imagination.

Whatever your requirements, see your ASE Dealer or write for new catalog.

ALL-STEEL EQUIPMENT INC.
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For the classroom

For the principal's office

Von Duprin 66
"the safe way out"
in stainless steel
● Stainless steel . . . slim silhouette . . . sure safe operation.
They're all yours in the Von Duprin 66, the exit device that introduced the industry to the practical beauty of stainless steel.
Available in rim, mortise lock and vertical rod models (in bronze as well as stainless steel) with a smart new series of matching outside trims.
Write for your copy of Bulletin 581 . . . full details on construction, function and accessory items.
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COMING SOON! NEW INCOMBUSTIBLE ACOUSTICAL TILE FROM BESTWALL: A MAJOR BREAKTHROUGH IN TILE DESIGN GIVING YOU 'SPACIAL SILENCE'. SEE IT SOON.

FIREPROOF GYPSUM
BESTWALL®
BUILDING PRODUCTS

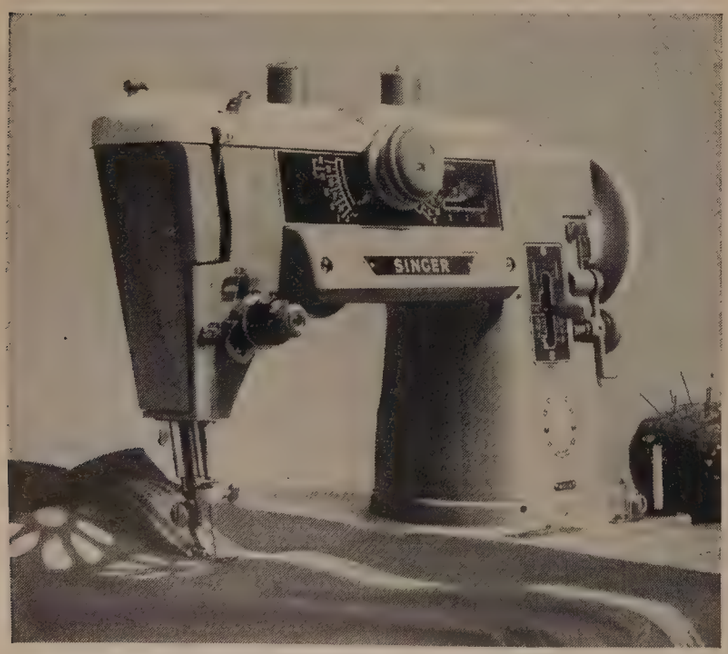
BESTWALL GYPSUM COMPANY
Ardmore, Pennsylvania
Plants and offices throughout the United States

Now! 3 Slant-Needle Machines by SINGER ...made in America by American craftsmen

Zig-zag and straight-stitch models with interchangeable accessories ... ideal for classrooms

New SLANT-NEEDLE Deluxe (#404)...finest straight-stitching machine for *every* type of fabric from gossamer-light sheers to bulky coatings. Great variety of easy-to-use attachments for supplementary work.

New SLANT-O-MATIC Special (#403) ... lets you do straight stitching and a variety of zigzag and decorative stitches. Comes with a set of "FASHION* Discs" for additional decorative stitches.



Famous SLANT-O-MATIC* (#401) ... greatest all-purpose machine ever made ... simplest to operate! To do buttonholes, decorative stitches, sew on buttons, blind-stitch hems without attachments, just "tune" the knob.

Special prices to schools.

The perfect series for classroom use!

Fixed bobbin case • Easy-threading drop-in bobbin • Needles, bobbins, other parts interchangeable • Needle slants toward operator • Gear motor drive for no-stall stitching • Built-in threading chart on each machine • "On call" maintenance service • Simplest for school operation • Choice of space-saving desk cabinets • Rugged construction.

1-to-5 ratio

Classroom experience indicates a good ratio of zig-zag to straight-stitching machines is one to five. Students learn everything that a straight-stitching machine can do and have some experience on the latest automatic zigzag equipment.

For details write to Singer Sewing Machine Co., Education Department, 149 Broadway, New York 6, N.Y.

SINGER SEWING CENTERS

Listed in your phone book under SINGER SEWING MACHINE CO.

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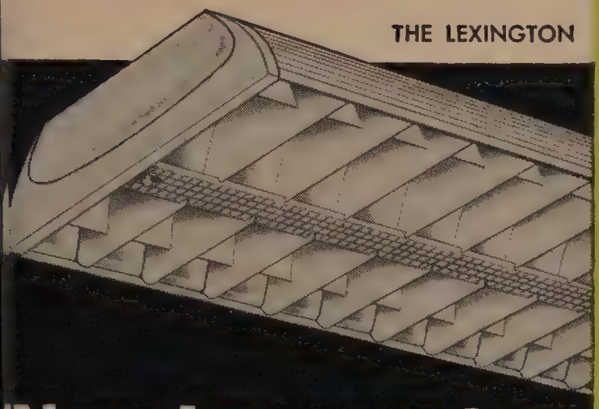
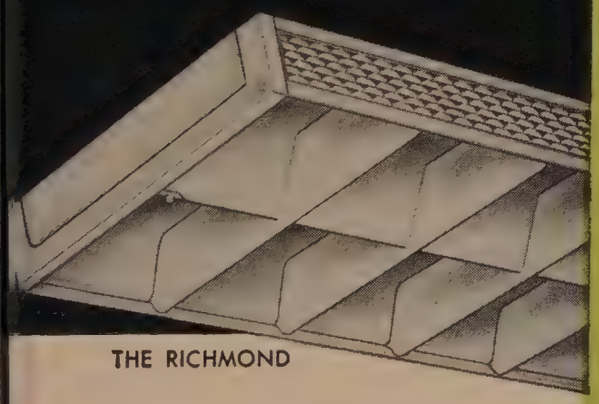
Now Available for
1960 SCHOOL PROJECTS

- **New Construction**
- **Renovation**

THE LEXINGTON



New Improved RICHMOND and LEXINGTON ...at New Low Prices



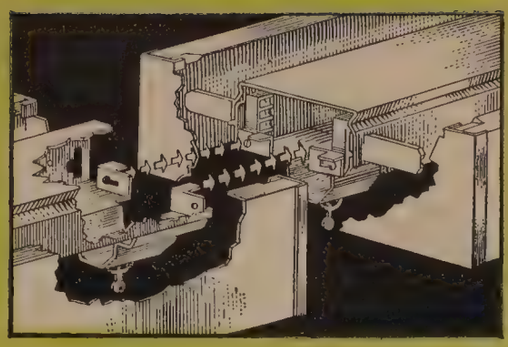
THE RICHMOND

The newly Improved Richmond and Lexington Series by Miller offer outstanding Values for lighting Schools, Offices, and Stores.

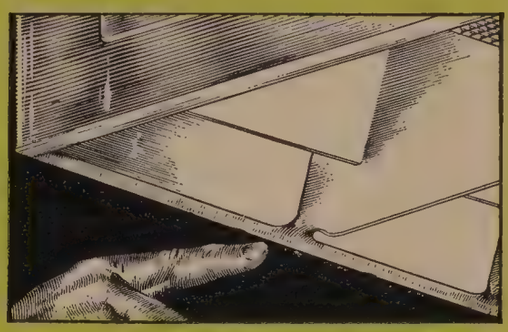
Four exclusive *installation and maintenance features* have been built into all units in both series. *Prices for most types are at new lows*, while illumination performance remains high as ever. Trimmer, more modern appearance is another plus.

You can choose between 45° x 45° or 35° x 25° shielding for both series; or 4 Lp., in 4 or 8 foot lengths. *Power-Groove* operation is a brand new option for the 2 Lp. Richmond.

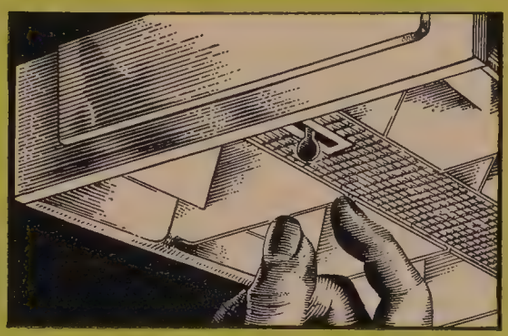
For complete catalog information mail coupon or write Dept. RL 460. For a physical demonstration contact your Miller Representative, or your Miller Distributor.



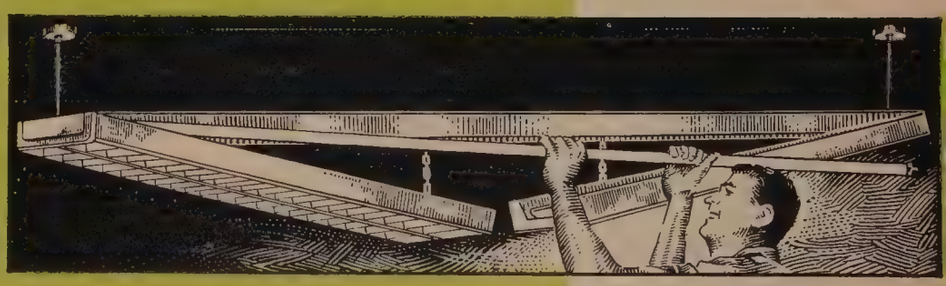
Sure Alignment . . .
Built-in Connector



Rigid, Rattle-free
Shielding Assembly



Sure Locking, Visual
Action Latches



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THE MILLER COMPANY, Meriden, Conn.

☐ I'd like additional information about The New, Improved RICHMOND & LEXINGTON Lighting Fixtures.

☐ Have Your Field Representative contact me.

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MERIDEN, CONNECTICUT • UTICA, OHIO

Where security counts, count on USS Cyclone Fence

This is the easy way to protect people and property

USS Cyclone Steel Fence is the simple solution for safeguarding lives and property in a public place. It protects children from traffic, stands pat against thieves, vandals and trespassers . . . and seldom succumbs to attacks of wind, fire or corrosion. It is extremely difficult to get through the fence or *over* it. And Cyclone Gates have a precise locking device that discourages unwanted entries.

USS Cyclone Steel Fence provides efficient, 24-hour protection at a reasonable cost for schools, parks, and all kinds of municipal projects. Write us today for details and complete specifications. American Steel & Wire, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

USS and Cyclone are registered trademarks

American Steel & Wire
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Cyclone sales offices coast to coast

No school should be without this

Very personal service

rest room vendors for Kotex feminine napkins

Vending machines for Kotex belts are also available at a nominal cost.

More than just a convenience, handy, coin-operated vendors make Kotex feminine napkins readily available at all times. They provide a needed and appreciated service for students and teachers. Vendors are available without charge.

Kotex is Confidence. When you offer new Kotex napkins, you provide the feminine protection most girls prefer. That's because every tapered Kotex napkin now has a new softer covering, pleated ends for a smoother fit and the Kimlon center for longer-lasting protection.

******************************** CLIP AND MAIL *******

Kotex products sponsor free, a complete program on menstrual education for both elementary and high schools.

The Story of Menstruation—a delightful 10-minute, 16-mm. Walt Disney sound and color film which gives a warm, natural explanation of just what happens during menstruation and why.

You're A Young Lady Now—bright new edition! Especially written and illustrated for girls 9 to 12.

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Instructional Aids—Physiology Chart, Teaching Guide, Mother-Daughter Program and Product Demonstration Kit.

KOTEX and KIMLON are trademarks of KIMBERLY-CLARK CORPORATION

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☐ Please send me complete details and ordering information on the Kotex Educational Program

☐ Please send information on the vending machine service for Kotex feminine napkins.

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CITY_____ ZONE____ STATE_____

For additional information, use postcard facing back cover.

DEPEND ON DODGE FOR SAFETY AND SAVINGS!

A Dodge school bus chassis is the soundest foundation upon which you can build dependable school transportation.

Sound in safety, even in excess of NEA standards, with extra-big brakes; gear-before-axle steering; a driver-adjustable emergency brake system.

Sound in economy, with a choice of thrifty L-head Six or Power Giant V-8 engines for peak performance on regular gas; long-lived Dodge quality construction; low initial cost.

Your Dodge dealer will be pleased to point out many more reasons why a Dodge school bus chassis is the soundest investment you can make in dependable, safe, economical school transportation. Why not give him a call today?

◄ **Dodge School Bus Chassis** are built for bodies that accommodate 30 to 66 pupils. Choice of five wheelbases; 15,000 to 22,000 lbs. G.V.W.

Dodge Town Wagon is ideal for small routes or "feeder" use. Easily carries eight pupils, can be converted to haul athletic equipment or other materials. ►

DEPEND ON **DODGE** TO SAVE YOU MONEY IN **TRUCKS**

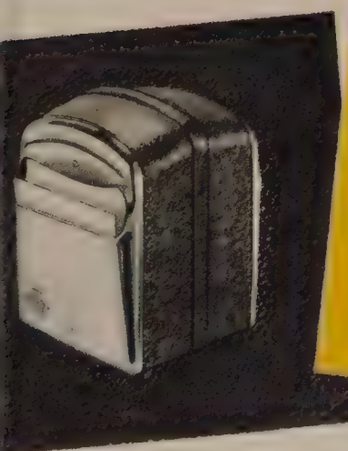
A PRODUCT OF CHRYSLER CORPORATION

For additional information, use postcard facing back cover.

Marathon complete napkin service... less cost per meal served!

Marathon napkins may cost more per thousand —but they cost less per meal served. Soft, strong and absorbent, one Marathon napkin will do the job of several ordinary napkins. Sturdy dispensers stay in place, dispense easily one at a time with no waste, no tearing.

Complete range of sizes and folds... complete range of dispenser styles and colors



Tux and Compact napkins are available in three sizes. Dispensers in nine beautiful finishes. Multiple-cabinet styles for cafeteria lines or waitress stations.

Super-Serv is large, extra-heavy and in two sizes. Dispenser black or chrome.

Marathon Napkins... at your service!

MARATHON

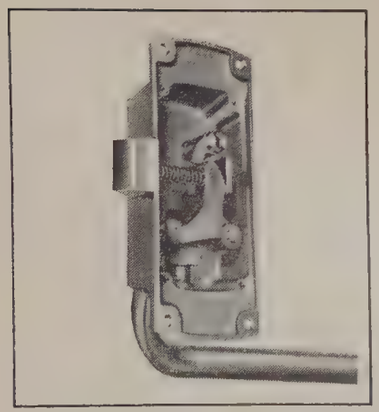
A Division of American Can Company

MENASHA, WISCONSIN

Always safe exit with Russwin Rim Exit Bolts

Where exit is vital...

Russwin Rim Exit Bolts!

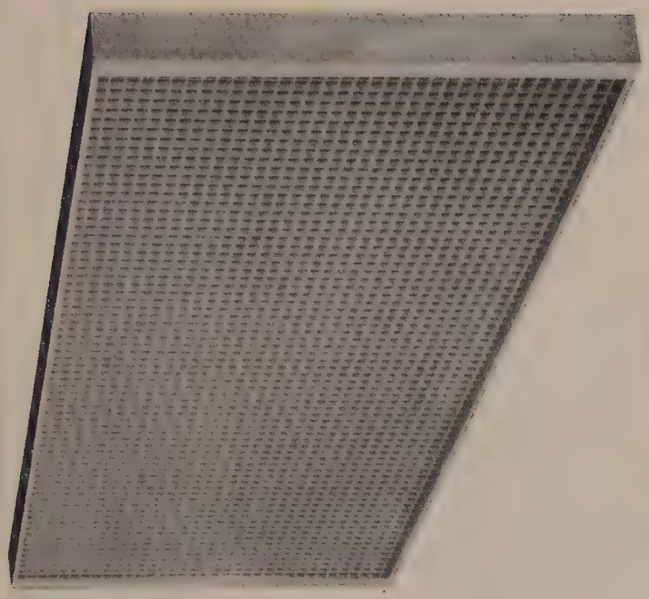


Look! Only three moving parts in Russwin Rim Exit Bolts. Simple, abuse-proof, dependable. It's one of many "school-right" features you'll find in Russwin hardware.

Fire! May it never strike your new school. But there's too much at stake to take chances. For dependability in exit hardware specify Russwin Rim Exit Bolts. They're safety-engineered for schools. See your Russwin supplier. Or write for literature to Russell & Erwin Division, The American Hardware Corporation, New Britain, Conn.

RUSSWIN®

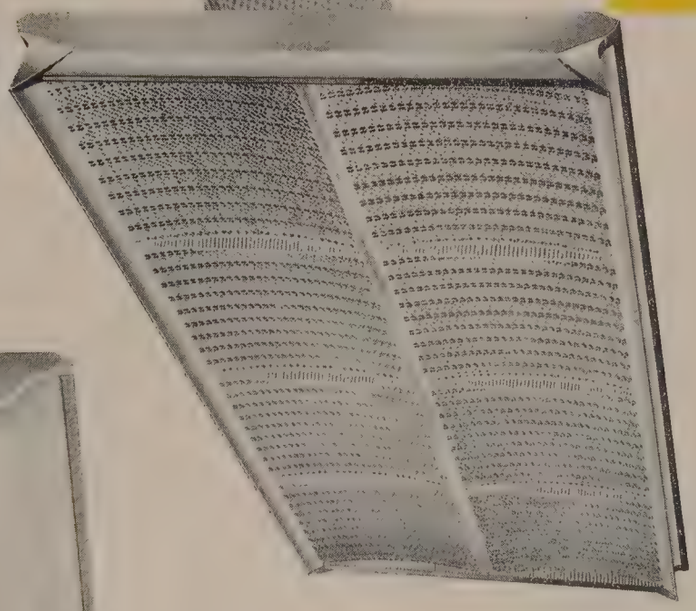
QPLM6500 for thin-lined architectural appeal.



QPCX7400 "Wrap-around" all-plastic enclosure.

QUICK CHANGE LIGHTING

QRH7500 (Sculpturama®) with all-curved styling.



QP8500 (Shallorama®) pioneer in shallow surface-mounted lighting.

In these days of expanding and shifting school districts a new degree of flexibility is needed to meet change head-on. Open plans, movable partitions, suspended ceilings and quick-change lighting are as fundamental to modern school construction as the alphabet is to language. Therefore, when you specify Sunbeam Lighting Visionaires® #6500, #7400, #7500 or #8500 you are automatically planning ahead. The diffusers to these versatile fixtures are all interchangeable. They give you a wide choice of 16 different lighting possibilities. The principal might select QP8500 (Shallorama®) because of its recessed look and wide light distribution, the teacher might select QRH7500 (Sculpturama®) for its sculptured look and its excellent low brightness control, and the schoolboard might select QPCX7400 ("Wrap-around") for its soft diffusion and low maintenance.

SUNBEAM visionaire LIGHTING COMPANY

Investigate how Sunbeam Lighting today can save tomorrow!

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e imagination of a gifted child captures a clown in clay . . . and every skill of the teaching art shares the classroom. All the new ethods and new tools of a dedicated profession create an environment to encourage and direct his energies. Part of that environment ould be classroom furniture that reflects **planned** creativity in its scientific design and manufacture. With this in mind, we recom-end that you specify the Virco #751 Lift-Lid Desk (shown below), the #752 Open Front Desk and the #260 Chair. Our new full-color talog provides specifications on Virco's complete line of school furniture for kindergarten through college. Write today to: Virco Mfg. rporation, Department A-9, Post Office Box 44846, Station H, Los Angeles, California. (Plants also in Arkansas and Pennsylvania.)

VIRCO

11:00 A. M.

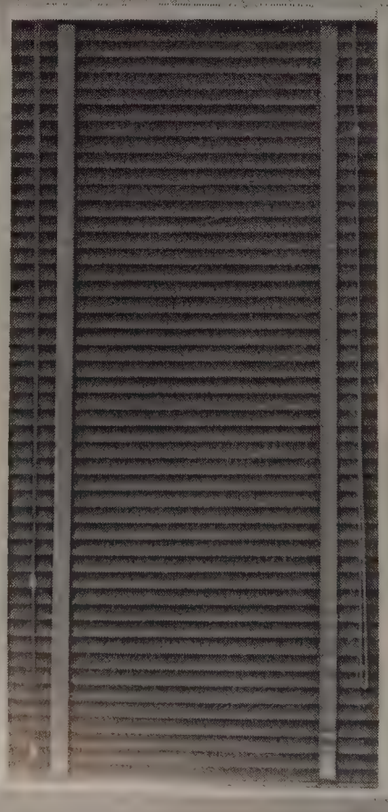
This movie is really sharp! Not a light leak anywhere.

REASON: The windows in this room are light-controlled with Flexalum Audio-Visual Blinds. These blinds make any room theatre-dark anytime. Here's why: (1) more slats per height plus (2) patented notch in each slat that permits adjacent slats to touch, equals (3) no between-slat light leaks. (4) Light-trap channels eliminate around-the-edge light leaks.

11:10 A. M.

The slides look great. Just enough light to take notes.

REASON: You get just the degree of light control you need with Flexalum Audio-Visual Blinds. No other kind of blackout covering allows you this flexibility. And Flexalum Audio-Visual blinds will always work smoothly, just where you want them. They're the only blackout guaranteed to perform as these blinds do. Only a professional [illegible] for [illegible]



11:20 A. M.

Back to groupwork. Full daylight, instantly—no glare.

REASON: Nothing to take down, nothing to tug back. No wasted money for multiple coverings, no wasted classroom minutes. Flexalum Audio-Visual Blinds do the *whole* job — taking you from projection darkness to full light (or anything in between) with just a flick of a nylon cord. The plastic lined side channels eliminate all noisy flutter!

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LOOKING FORWARD

It *Is* Federal Control

THERE'S something quite naive in the way we school people talk about federal control of education. Some of us seem to think that federal influence on education can be prevented simply by stating that it shall not exist.

The next time someone tells you that he is absolutely opposed to federal control of education, ask him to define what he means by control. What is it? How does it operate? How does it grow?

Federal direction is inherent in any federal law or any federal court decision pertaining to education. This is true, even if Congress delegates to the *states* the *administration* of a federal grant.

Any federal law or court decision that changes the nature of the curriculum or modifies the organizational structure of a school or college is exerting a form of control. Every time that Congress appropriates money for a specific purpose in public education, whether it is for vocational education, guidance, testing, school lunches, science and languages, or research, it brings about a change in the existing school pattern. These influences take place through the *earmarking* of grants to schools for various specific purposes and through required *matching* by the state or the local district. Even a federal grant for teachers' salaries and/or schoolhouse construction becomes a federal directive, and as such operates as a form of control.

Let's not misunderstand each other. We are not saying that all these forms of federal help to various kinds of educational activity are undesirable. (In fact, we believe that generous federal support for the operation of public schools is imperative.) We are saying that the federal government has pushed schools and colleges into certain channels or programs, and by so doing has decreased their desire or their ability to pursue other kinds of programs. Take, for example, the National Education Defense Act, which by its substantial financial aid brought about a much greater emphasis upon science, mathematics and languages in our schools and colleges and lessened their attention to the humanities. Again, we are not saying that this change is necessarily bad. We are insisting, however, that it is a change that has been brought about by federal legislation.

In the field of higher education several federal programs are setting up trends and policies which tend to establish a pattern of federal influence and pressure. Homer D. Babbidge Jr. of the U. S. Office of Education has reported that of some 5000 students being financed by federal graduate fellowship programs, 80 per cent are taking work in mathematics and the sciences. Under the National Defense Student Loan Program, more than 100,000 young men and women are receiving *federal* financial aid amounting to more than $50 million this year. This means that universities and colleges are expanding and accelerating their course offerings in those areas emphasized by the N.D.E.A., namely, science, mathematics and languages. Similarly, colleges and universities throughout the country have reorganized their programs to accommodate *federally financed* institutes for secondary school personnel in the fields of mathematics, science, foreign languages, counseling and guidance. No federal funds, however, have been available for such institutes in the social sciences.

Through the research programs of five federal agencies, $750 million will go to universities or to centers associated with universities for research this year. Consequently, 70 per cent of all research conducted by our universities is federally financed. Again, the federal program largely determines the nature, the scope, and the extent of research by our universities and also attracts into the more lucrative research fields a considerable number of the faculty members who otherwise would be available for teaching in the classroom. Good or bad, isn't this a form of federal control?

Certainly it is evident that these projects are changing the emphasis, shifting the personnel, and modifying the programs of institutions of higher learning.

The most positive and irrevocable control over public education is exerted by the Supreme Court and other federal courts. Such exercise of legal power goes back to the Plessy *v.* Ferguson case in 1896 when the Supreme Court gave legal sanction to the "separate but equal" doctrine. This principle was explicitly applied to schools in the Gong Lum *v.* Rice case in 1927. Just as positively, the Supreme Court wielded federal power when, May 17, 1954, it completely reversed this decision and a year later ordered schools to be integrated with "deliberate speed."

The Supreme Court exercised federal control in 1925 when it ruled in the Oregon case that a state may not deny to parents the right to send their children to private or parochial schools and, more recently, in the New Jersey case, when it ruled that free bus transportation for parochial school children in public schools buses is not a violation of the principle of separation of church and state. Various other Supreme Court decisions, such as those relating to the teaching of religion in the schools, are further evidence of this phase of federal control over public education.

(*Continued on Next Page*)

We are not trying to turn back the tide. We are asking for recognition of the fact that the tide is here and is exerting considerable force. Our big assignment now is to determine how that force can be controlled and utilized. Through what agencies can public opinion bring pressure upon Congress to minimize its political control in matters pertaining to education? How can we reserve to the states the initiative and the grass-roots control for public schools and higher education, while at the same time recognizing that the federal government has a legitimate interest in education for reasons of national security and national welfare?

The big question is not whether federal control over education exists or is desirable, but whether those of us who fear federal bureaucracy in control of public education can prevent its gradual and eventual evolvement. Stated tersely: How are we going to *control* the control that inevitably comes with federal grants and services?

Learning *About* Religions

IT IS encouraging to learn that the majority of this nation's school administrators, as indicated by this month's opinion poll, believes that a knowledge *about* other great religions should be a part of a child's cultural heritage. Such vision on the part of educators may eventually lead to religious literacy for the American citizen.

But bigotry will block any substantial progress in this direction. Zealots will not want their children to *know* about — much less *think* about — any religion other than the one in which their own children are being reared.

Other hurdles include the lack of adequate information and teaching materials. How difficult it will be to write a textbook on other religions that will be accepted as factual and objective by a majority of today's citizens!

Another difficulty is the lack of qualified teachers. It is better that the subject not be taught at all than taught poorly. It hardly can be expected that unbiased teachers for such instruction can be recruited from clergy trained for any one religion. Rather, the teaching of this subject would need to be a special interest for the historian or the philosopher.

But the day will come, though perhaps not in our lifetime, when the knowledge transmitted to our grandchildren in school will include a basic understanding of the world's religions. Meantime, would you like to test your own knowledge?

Of course, you are familiar with your own Judaeo-Christian religious heritage. You remember from your study of history in high school how the Crusaders fought the Mohammedans, and how the invasion by the Saracens brought some of the Moslem culture (including the making of paper) to Western Europe. The separation of Pakistan from India may have been explained in your newspaper as resulting partially from differences in religion, Islam *versus* Hinduism.

But what have these miscellaneous facts actually taught you about the *beliefs* of these great religions and the tremendous impact they have upon the world in which we live today? Arnold Toynbee* comments: "The higher religions have had a longer hold on a greater number of minds and hearts than any other institutions known to us to date." And, he adds, "the annihilation of distance has brought all the living higher religions into closer contact."

Out of the moral and spiritual values inherent in the great religions come the attitudes, customs and motivations that express themselves in nationalism, racial conflict, and complications in world relations.

Toynbee reports that "in the Twentieth Century there are at least seven higher religions to be taken into account . . . . There are three *Buddhic* religions: the Hinayana Buddhism of Ceylon and Southeast Asia; the Mahayana Buddhism of Eastern Asia, Tibet and Mongolia, and the post-Buddhic Hinduism of India. There are three *Judaic* religions: Judaism, Christianity and Islam. And there is the *Zoroastrianism* of the Parsi diaspora in Southeast Persia and Western India, a religion that is decidedly Judaic in spirit and outlook, whatever may be its historical relation to Judaism on the one hand and to pre-Buddhic Hinduism on the other."

We clearly understand Toynbee to say "that all seven religions speak with one voice in urging the human self to 'get rid of its innate self-centeredness . . . if he wishes to be in harmony with Absolute Reality (whom we call God).'" Toynbee believes that the consensus of six of these religions (all except the Hinayana) "in holding that *the great spiritual presence known to man has a personal aspect* is a bond of unity which transcends the differences between their views as to what the personal aspect is." In other words, a universal belief in a personal God can be the means to other agreements between nations and religions.

We clearly understand Toynbee to say that "all to an understanding of other religions. The same intolerance would resent Toynbee's indictment that "we are all inclined, to some extent, to assume that our own religion is the only true and right religion; that our own vision of Absolute Reality is the only authentic vision; that we alone have received a revelation; that the truth which has been revealed to us is the whole truth, and that, in consequence, we ourselves are 'the Chosen People' and 'the Children of Light,' while the rest of the human race are gentiles sitting in darkness."

Here, then, is the plea of a great historian for us to become both cognizant and conversant with the characteristics and underlying values of other living religions. Who knows but what religion in its broadest sense, in seeking to understand the mystery of why we are here, may lead the way to world peace and brotherhood? Certainly the least that can be asked of our schools is that they eradicate today's illiteracy concerning the world's great religions.

*Toynbee, Arnold: An Historian's Approach to Religion. New York: Oxford University Press. 1956. Pp. 265-285.

The Editor

We Did Away With Study Halls

EDWIN W. BRIDGES
Assistant Principal, Griffith High School
Griffith, Ind.

Seventy-minute class periods have replaced study halls in this high school. Result: Teachers spend more time teaching and guiding *effective* study

STUDY HALLS encourage disciplinary problems. The result is that the teacher or supervisor of the large study hall is part policeman, and "a policeman's lot is not an 'appy one."

After a full year of planning, we tossed the study hall system out of Griffith High School back in September 1958. Now, two school years later, we can, in some degree, assess the results.

The key to life without study halls at Griffith High is the 70 minute class period (including time for supervised study), which replaced the familiar 55 minute period. Students now take six subjects, instead of five, and classes meet for 70 minutes four times a week, instead of 55 minutes five times a week plus study hall. A schedule for a typical student is shown on the next page.

To determine the effectiveness of the 70 minute program after two years of experience with it, an evaluation questionnaire was distributed to students, parents and teachers near the close of the 1959-60 school year. Those in each category strongly endorsed the plan. Only 7.5 per cent of the students, 15 per cent of the parents, and 16 per cent of the teachers urged a return to 55 minute sessions.

We are still learning, but we regard the change-over as a successful advance.

Broader Curriculum

Under our traditional program of five classes and study hall we had offered our secondary students a fine comprehensive curriculum, including three years of science, four years of mathematics, and two years of foreign languages. With the 70 minute class plan we could retain all this and add more. We increased our course offerings from 47 to 56 subjects, adding journalism, speech for sophomores, two sections of developmental read-

ing, community problems, photography, a science seminar for the gifted, advanced biology, advanced bookkeeping, and additional sections of sales-business law.

The teacher total remained at 26, including three part-time instructors, and the student-teacher ratio stayed at a satisfactory 25 to 1.

Activities Day

Every Wednesday now is club day. The 70 minutes from 11 a.m. to 12:10 p.m. are set aside for an activity period during which homeroom sessions, assemblies and club meetings are scheduled.

Not every student is club minded, and that presented a problem. The student council sprang into action, polled the students, and came up with a solution: Divide the 70 minute period into two equal parts and let students elect to attend club meetings, study in the library, or pick an appealing activity out of the following array — badminton, ping pong and other table games, weight lifting, volleyball, dancing, films, and classical, jazz and popular music.

A number of students now pass up the whole list in order to undertake extra assignments in their favorite subject or under their favorite teacher. Often they work on scientific projects in one of the labs. It is wonderful to see how this midweek break in school routine builds esprit de corps between and among students and teachers.

Another change: It had always been hard to schedule our six weeks' course in driver training. Under the new regimen this was programed through physical education classes. We assigned the girls wanting driver training to third period physical education, and the boys to fourth period. The instructor was able to set up a rotating schedule so that the students could be excused from physical education for a six-week grading period without loss of credit. This was possible because our school's physical education requirements considerably exceed state requirements.

Administrators and teachers agree that certain advantages have accrued from the 70 minute class period. Among them are these: fewer discipline problems and interruptions, more efficient and effective use of the library (formerly a study hall), and a more compact individual program, which permits students to carry courses formerly available to them only during summer school.

Elimination of study hall periods did create some new problems, and they have not been solved entirely.

One result we never anticipated was the acceleration of student advancement, with the resulting increase in the number of midyear graduates. To meet this development, a teacher-administrator committee reviewed the prevailing graduation requirements of 32 credits, or 16 units.

Several proposals were considered. One was to step up the requirements to 38 credits; another was to increase requirements on the basis of the type of curriculum pursued. But in the end no change was found necessary. Under the guidance of our counseling staff students have elected for 1960-61 a schedule of courses consistent with their interests and abilities. Only two students expressed a desire to be graduated at midyear, even though the majority had 28 to 31 credits by the end of the junior year. Encouragement, rather than legislation, seems to have been the answer.

Disadvantages of System

The evaluation committee has found some other disadvantages of our 70 minute system:

1. Student schedules are harder to arrange because the new program lacks the flexibility of the study hall program. Although scheduling now is a more complex process, it does offer the advantages of individual planning as opposed to group planning.

2. Slow students who had trouble managing four or five subjects are more than ever frustrated with six courses, even though classes meet only four times weekly. To offset this difficulty, we hold individual conferences with the student during the registration period to give him help in selecting courses. In the end, we have decided to require only five courses of the weaker student, with the sixth assignment consisting of supervised study in a resource room along with 15 or 25 other students.

While the weak students have opposed the new program, our records show there have been fewer failures among students carrying an extra subject. We believe it is safe to conclude they can carry a heavier load without the failure rate's increasing.

3. Some parents have complained that certain teachers do not allow enough study time during the 70 minute class period. Our answer to that complaint is that during the supervised study period teachers can analyze learning difficulties and can correct errors in the learning process before they become fixed.

Since the 70 minute class program requires considerably more effort on the teacher's part in preparation, organization and planning, we are find-

(*Continued on Page* 110)

Typical Student's Schedule Under 70 Minute Classes

Meeting Four Times Weekly

(Grade 9)

Day	8:30-9:40	9:45-10:55	11-12:10		1-2:10	2:15-3:25
Monday	English	Biology	Health and Safety	LUNCH 12:10 - 1:00	Phys Ed	Shop* (Diagonal)
Tuesday	English	Biology	Health and Safety		Shop* (Diagonal)	Algebra
Wednesday	English	Biology	(Activity)		Phys Ed	Algebra
Thursday	English	Shop* (Diagonal)	Health and Safety		Phys Ed	Algebra
Friday	Shop* (Diagonal)	Biology	Health and Safety		Phys Ed	Algebra

*Meets:

Monday	2:15	Thursday	9:45
Tuesday	1:00	Friday	8:30

TEACHERS are relieved of many clerical duties at Palatine (Ill.) High School District No. 211. Here two teachers give material to a secretary for processing.

Better teaching, better morale — with our

CLERICAL POOL

PHILIP C. WELLS
Associate Professor of Education
Northern Illinois University

MARTIN M. PLATE
Administrative Assistant
Palatine Township High School
Palatine, Ill.

EXPANDED teacher services and clerical aids "pay off." As proof we offer the experience of the Palatine High School District No. 211, Palatine, Ill.

Our district provides a test scoring service to teachers, a duplicating service, a make-up test service, a multiple mailing and duplicating service, and a general clerical service that includes transferring grades from teacher grade books to permanent records and report cards.

Several methods of clerical organization were tried in Palatine before the clerical pool system was proved best for the school's needs and superior to assigning clerical helpers to individual teachers.

A group of teacher helpers, all trained office and clerical help, is housed in a teacher service room with office equipment to perform most of the clerical duties of a high school teacher.

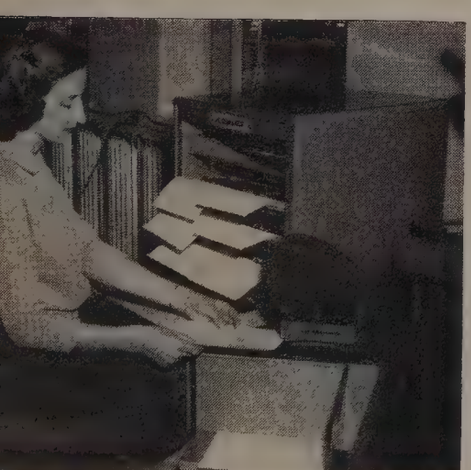
To this room teachers bring tests to be scored, tests to be typed and duplicated, grades to be recorded or transferred, any duplicating or multiple mailing work, or any other of the time consuming clerical duties of a teacher.

If the work can be done more efficiently in the classroom, office workers are on call to assist when needed. With the exception of the electronic scoring machine, which has a single trained operator, *all* equipment can be operated by *all* clerical employes.

A make-up testing service allows a teacher to file a quiz or test with the secretary in charge. A student

DUPLICATING

FOLDING



COLLATING

SCORING

who has been absent on the day of an examination may have the test administered to him by the secretary before school, during a study hall period, or after school. The completed test is returned the next day to the teacher. It is scored and ready for recording in the grade book.

Teachers need not score objective tests or examinations, not even the small weekly quiz type! The major tests and examinations are machine scored and are returned to the teacher. Each test is returned with a test profile showing the number of times each test item was marked correctly. This makes item analysis of the test an easy task. For smaller weekly quiz type testing, the teacher furnishes the key and an office clerk does the scoring. These are one-day services.

Prepare Teaching Materials

All typing of tests, guide sheets, outline materials, and other supplementary teaching materials is done by trained office help as a one-day service. If, however, the teacher finds himself in an emergency situation, typing and duplicating services can be, and often are, handled immediately.

Literally millions of professional teacher man-hours are spent each year in transferring grade marks from one record to another. Palatine has cut this operation for teachers to a minimum by having clerks do most of the routine copying of pupil marks. The district also uses machine pupil accounting. Pupil grades need to be hand transferred only once — to master cards. Complete mechanically duplicated reports can be obtained from the master card in minutes.

Plates for addressing are maintained for all students and parents of the district. If for any reason a teacher or administrator wants to send a special mailing to any grade level, students or parents, this is accomplished with the minimum of effort.

The teacher service program, as experienced at Palatine, lends itself to better quality education because:

1. Teachers are released from many routine clerical tasks and are free to spend their released time on preparation for class presentation.

A class period at Palatine High School is 55 minutes. The school year comprises six 6 week periods of about 30 days each. Teacher services can take many clerical or organizational routines out of precious teaching time and can help reduce many of the necessary in-class clerical duties.

2. The emphasis on *teaching* as the principal duty has had a marked effect on teacher morale.

3. The teacher service program is a definite asset in the teacher recruitment program. It is also a factor in holding outstanding or master teachers.

4. Testing has been upgraded. Typed materials are neater, cleaner, clearer and more uniform. (People skilled in clerical duties are definitely better at this than the average teacher.) More proportionate "teacher time" goes into *preparing* tests and materials rather than *correcting* or following up tasks. The result is an over-all better test.

Palatine High School recognizes the need for more essay type work. Releasing teachers from correcting objective type tests has allowed them more time to prepare and evaluate essay work.

Experience shows that fewer scoring errors are made on objective type tests when a test scoring machine is used.

Teachers now give more tests and over more areas.

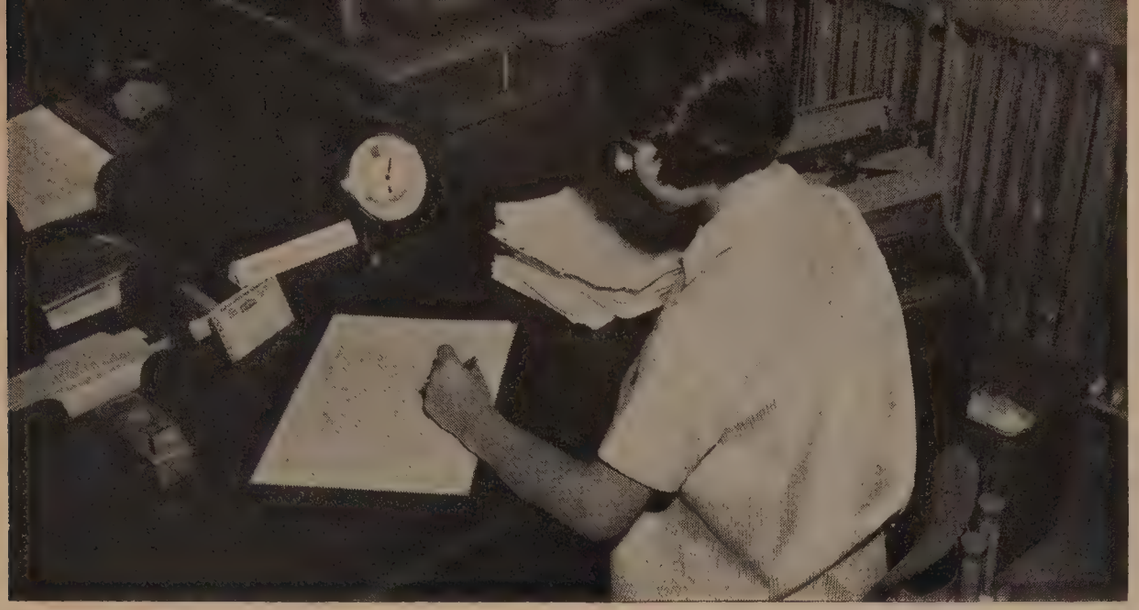
Teachers rarely have time to evaluate responses to each question on a test. Machine scoring provides an automatic graphic record of each correct response to each objective type answer. Class time for test follow-up is now more productive. The teacher knows ahead of time which questions were well known and which were missed.

5. Automated pupil reports and accounting have reduced teacher time in this task 50 per cent over the old hand system.

Not Costly

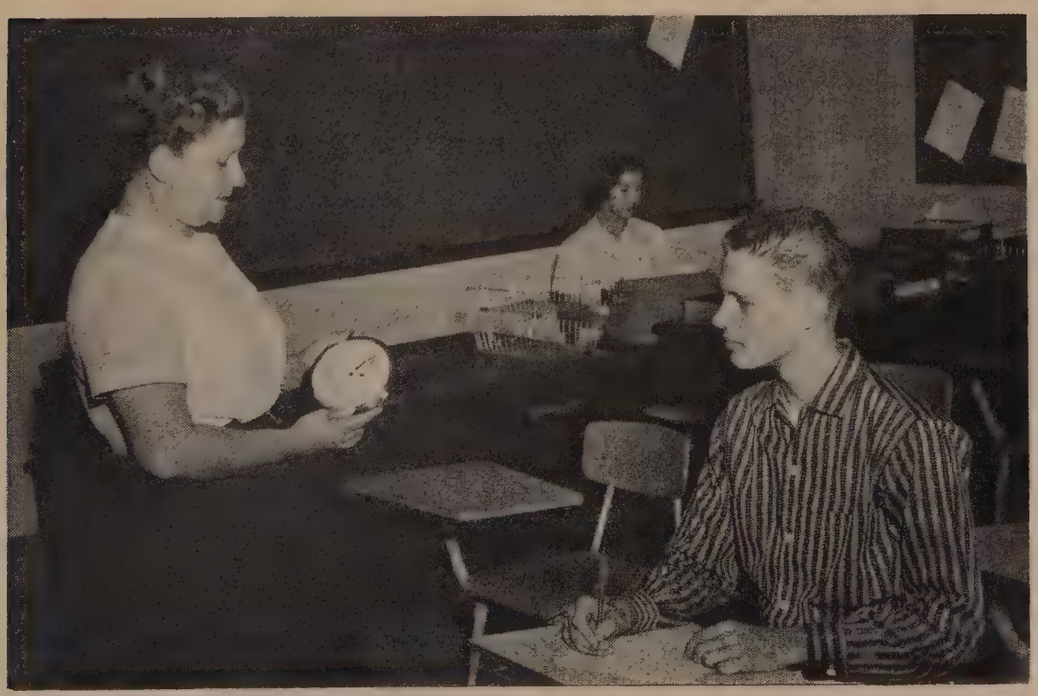
The cost of this program is not prohibitive. Hourly pay rates vary in different localities but $1.50 to $1.75 per hour is a reasonable rate in Palatine to attract part-time local housewives as clerical help. These women generally work only on school days. Their day varies from 4 hours minimum to 8 hours maximum. A few full-time salaried employes hold the continuity of the program together.

(*Text Continued on Page* 112)



SECRETARY records an entry into teacher's grade book. Standardizing the system of entries makes it easy for the teacher and supervisor to inspect and summarize evaluations.

TWO secretaries work in department having a quiz program. Answer sheets for short, objective quizzes can be scored easily by a clerical worker.



SECRETARY administers a make-up time test in arithmetic fundamentals.

A retired superintendent* compares

THE FIRST DAY OF TEACHING

47 YEARS AGO — AND NOW

JAMES M. SPINNING

"I was stoutly shod and I kicked — hard and accurately!"

JUST 47 years ago this month I landed in America, where I had my first view of the Statue of Liberty. I was not really a complete immigrant, but I *was* entering a New World — the World of Teaching.

You see, I was just back from the grand tour of Europe. With three classmates I had sailed from Montreal, Quebec, the morning after the senior ball. I was fresh, so very fresh, out of college. Don't be deceived by my boast of foreign travel. I made that tour of seven countries, including a two-way passage of the Atlantic, for just $270. That money was the result of overstraining to earn my college keep. It was 20 years before my bank account got to be so large again. You can draw some idea of the scale of our travel when I tell you that I paid 5 shillings, equal then to $1.20, for my lodgings in London. Of course, that was only for one week.

Back in America I ignored Broadway and the Bronx Zoo and headed by Erie ferry and rail for Middletown, N.Y. (population, 26,000). There I had a job, obtained through a teachers' agency, which was to start the next day. I still had 270 left — $2.70. Most of that went for a new shirt.

I already had a good suit — a suit I had never worn. It had been fashioned by a London tailor according to his concept of the American cut of the period. It was a six-ply blue serge, with double-breasted vest and double-breasted coat, full skirted, and indestructible. The tailor's notion of American wear had not restrained him from building the trousers so that they reached my chest. That suit cost three pounds and weighed 50. And September 1913 was as hot as only September can be.

The suit had been under high compression for two months in a suitcase.

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*This nostalgic bit is an experience that Jim had told us personally, not for publication. We assured him that readers of The Nation's Schools would be interested, too, and so he tells us the story in lieu of his usual "On the Shelf" copy this month.—Ed.

It was a pristine affair for a pristine career. Nothing like the figure I cut in it had hit the Catskills since Ichabod Crane invaded Sleepy Hollow. It wasn't a beard that made me weird.

I managed to obtain credit for room and board in a house next to that of the high school principal. When he came back from the North Woods late in the afternoon my landlady hailed him and introduced me. "Here is your new teacher," she said. *He* said exactly nothing, but I could distinctly feel him sneer. He was a handsome and imposing person, the spitting image of General Pershing (only I didn't know about General Pershing then). He walked straight as two ramrods. I braced him that evening. When he got a good look at me his eyebrows went clear up over the top of his head and never came back. The interview was brief.

At nine the next morning 400 students gathered for registration. It took less than 20 minutes. There were only two choices.

I was handed my schedule of classes and shown the door — my classroom door. I stood just outside it as 39 seniors stumbled through. They all looked bigger than I did. Most of them were. With all my blue serge armor I weighed just 110 pounds.

I had been able to learn nothing about the course of study or what textbooks might be available or what was expected of me that first day. All I knew was that the periods would be 45 minutes long. They were all of that!

As I moved up the aisle to the front of the classroom, two great legs (male legs) suddenly swung out to trip me. I was stoutly shod and without looking down I kicked — hard and accurately — then turned with an elaborate and only faintly ironic apology. A yelp was smothered and an expectant silence born.

What next? The teacher's desk was bare of everything but dust. But I had been observing teachers from time to time for 16 years and in my pocket I had a small pad and three pencils. I knew I should get a class roll. I made little slips of paper, distributed and retrieved them. I was as scared as Anna in Siam, but my mouth was too dry to whistle a happy tune.

I figured the odds. The boy with the longest name would probably be a little fellow. I picked on John Eilenberger. I asked him some fool question. I've forgotten what. There was no response except for a wild and general titter and a pair of hoarse guffaws.

I remembered how my college math professor did it. Shooting my jaw and putting on *his* best basso profundo, I said, "Eilenberger, when I speak to you, you'll please *rise*." He got up slowly — right in front of me — and he continued getting up, all 6 feet 4 inches of him. I had picked the fullback of the football team and the general heller of the school. But I had him hooked. I repeated the question. Finally he stammered, "I d-d-don't know." I said, "Right! sit down!"

I don't remember that I had any trouble with discipline that year. No smart aleck had yet been born to invent the phrase, but I wanted no jungle along with my blackboard.

Got a Kick Out of It

The kick, it seems, had been as effective as the voice because it turned out that the boy I had kicked was the principal's son. Weeks later the lad told me why his father had snubbed me so hard. My predecessor had been hired by the superintendent, as I was, sight unseen by the principal. His classes had walked all over him. The afternoon of the kick, the principal had said to his son, "Well, I suppose we'll have to get rid of this one, too." The youngster said, "I guess maybe not, pa," and rolled up his trousers to show his shin and what glorious vivid technicolor would be like when it came.

It was a great year. Five days a week I had two classes in senior English, two in freshman English, and two in grammar. One person learned grammar that year. Me!

In addition, I had only to supervise the big study hall for one period, coach something called rhetoricals for an hour after school every day, put on the senior play and take it on tour, chaperon all hayrides and houseparties (What I could have learned from those youngsters if I had dared!), escort the athletic teams to and from each fray, and get 12 seniors ready to make audible and creditable commencement orations for 15 minutes each in the Opera House.

First prize was awarded to the lad who proved so perfectly that a major war could never again be fought on this planet. It was still two months to the invasion of Belgium and the War to End Wars. John Eilenberger, 6 feet, 4 inches, with the longest name, was killed in that war.

Yes, it was a great year. I learned by trial and error. With so many errors there could be small excuse for my not learning fast and plenty.

But what is the moral of all this? That if you must kick, you should kick high — as high as the shin of the son of a principal? I don't think so. I blush with shame and not with pride over my first day's violence. If I had had the experience of practice teaching, the handbooks of local information, and the careful briefings that beginners now get as S.O.P., there would have been small call for me to crowd the brink with a show of force which I did not possess. With today's training I might have won friends and influenced kids without brandishing a bull whip at them. Had I gone on as I began, I should have ended long before I did.

In many ways I had cause to be grateful that my lines had fallen in a well ordered school, and yet I found myself rebelling against its rigidities in discipline, in teaching method, and in curriculum. While I still believe that there should be a sureness of touch about the teacher and a dedication to the serious business of the classroom, I am glad that I soon learned from more experienced hands that these things can be achieved in better ways and that growth is as important for the teacher as for the pupil.

But let me ask: How did *you* make out that first day? ■

Schools Should Teach 'About' Religions But Are Doing Enough on Moral Values

PUBLIC high schools should find a place in the curriculum to teach *about* religions. Except for this addition, schools are doing all they reasonably can be expected to do in the teaching of moral and spiritual values.

These views were expressed by the majority of administrators responding to September's opinion poll.

Fifty-two per cent favor instruction *about* religions in the high school curriculums. Taking the long view, a Michigan schoolman commented: "I believe knowledge of the various religions — their basic beliefs and objectives — can be of significant value in helping to further national and world understanding."

A superintendent from Missouri favors teaching about religions in the high school "if the material is carefully planned and taught by persons who could maintain an unbiased and objective point of view."

"Every high school student should be taught about religions," stated a Texas administrator. Then, adding this prayer, said: "God help the teacher, however, who runs afoul of the bigots and crackpots in the community!"

Perhaps the 45 per cent who are against teaching about religions thought of this; at any rate, most of them anticipated trouble.

An Ohio official predicted that "the word 'about' would soon be lost and there could be trouble."

Some prefer that "comparative religions" be taught at the junior college level, where the subject might be chosen as an elective. Others contend that history courses offer enough teaching in this area for high school students.

Enough on Spiritual Values

Whether moral and spiritual values are taught or "caught," as one administrator suggests, public schools are doing as much as can *reasonably* be expected in this area, believe 61 per cent of the respondents.

Said a Washington superintendent: "With pupils' school environment restricted to a maximum of about 1080 hours during the school year, the best the school can do is *supplement* the teaching of moral and spiritual values, not assume the major responsibility."

Already, schools are teaching good sportsmanship through supervised playground activities; various classes are presenting the ideals of citizenship, mentioned a Nebraskan. Teachers act as examples and indirectly teach values to students, said an administrator from Minnesota. Schoolmen from Maine and South Dakota reported that their schools are participating in a program of released time for religious instruction in local churches.

Going a step farther, a Wisconsinite offered: "Knowledge of what is right does not necessarily lead to right conduct. The problem is how to bolster knowledge with a desire to *do* what is right. This calls for more practice and example."

Some respondents contend that the schools are doing their share in teaching moral and spiritual values, but other agencies are not. Said an Iowa official: "Perhaps it is a worn-out statement, but I still believe that the home should do most of this teaching."

One group of superintendents invoked the doctrine of separation of church and state. "I think all of us teach moral and spiritual values, but I can't see that the school should infringe on or take over the work that rightfully belongs to the churches," stated a Kansan.

"Probably the schools are doing all that it is reasonable to expect, considering the crowded curriculum, the wide variety of standards concerning spiritual values, and the time consuming duties of a noninstructional nature that are required of teachers," commented a Texan. "Nevertheless, results are not being obtained."

Thirty-eight per cent of the respondents would probably use the Texas superintendent's last statement as a reason for saying that schools should do *more* in teaching moral and spiritual values. A second administrator from the Lone Star State declared: "Tomorrow's citizens must be stronger spiritually to withstand the tempestuous onslaught of isms."

A Minnesota schoolman would accomplish this through "teaching by example only and entirely without words"; a New Yorker by "discussing questions of moral significance with individual pupils as pertinent situations arise"; a Wyoming official by "emphasizing fair play and honesty in all classes."

Before schools attempt to assume more responsibility, there are changes that must be brought about, caution some respondents. "Until we reach some reasonable standards on moral and spiritual values, the public schools are on shaky ground even if the teachers teach unofficially," maintained a Massachusetts schoolman. ■

OPINION POLL FINDINGS:

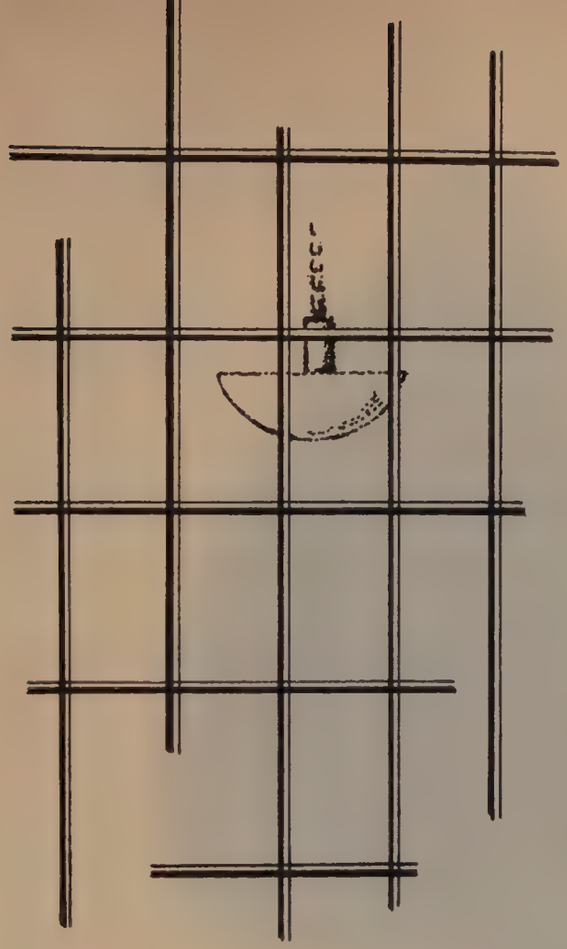
1. **Are public schools doing as much as can reasonably be expected in the teaching of moral and spiritual values?**

   Yes..61% No..38% No opinion..1%

2. **Should there be a place in the high school curriculum for teaching about religions?**

   Yes..52% No..45% No opinion..3%

Based on a 4 per cent proportional sampling of 16,000 school administrators in continental United States, this survey brought a 36 per cent response.



ADMINISTRATION STUDY NO. 7

School Lighting Principles *Applied*

To Design, Renovation, Maintenance

SCIENCE still disagrees as to what light really is, but there's no disagreement as to the importance of proper lighting in the classroom. Recent research has produced new facts to be interpreted and applied to school lighting. Illuminating engineers believe that the new findings call for more candle power in the classroom. Architects and educators seek to solve the same problem — the improvement of visibility — primarily through obtaining the maximum reflection of light and through better methods of controlling glare.

All the angles are presented in this timely study, prepared especially for administrators. The principles of school lighting, as established by research, are applied to the original design and the renovation of school buildings, to the maintenance of lighting systems, and to the role of the teacher and the administrator in obtaining and maintaining optimum lighting. Nationally known authorities in their respective fields have participated in the planning and production of this special study, with Wilfred F. Clapp, assistant superintendent for administrative services, Michigan State Department of Public Instruction, as special consultant. — A.H.R.

PRINCIPLES

Seven principles, established by research and tested in practice, govern good school lighting. Needed is an integrated, balanced design

WILFRED F. CLAPP

FOR all children, except, of course, those handicapped by blindness, school work involves seeing. Much of this work is "critical" seeing — seeing that involves focusing the eyes upon a visual task — as contrasted with relaxed vision, such as viewing a landscape. This being true, it is evident that the physical environment of the school should enable a child to see quickly, accurately and comfortably.

While it may be difficult to demonstrate that poor visual conditions actually do physical harm to the eyes, or that improved visual conditions will result in faster learning, it is self-evident that good visual conditions are necessary. It also should be realized that critical seeing involves the expenditure of physical energy. The better the visual conditions, the less energy need be expended. It is apparent that using large amounts of energy on visual tasks will leave less energy for other bodily functions and will result in tension, fatigue and irritation.

Recognition of the importance of better visual conditions is evidenced by attempts through the years to increase the amount of light in schoolrooms by both natural and artificial means. As compared with the schools of a few years ago having a few bare incandescent bulbs, dark finishes, and general gloominess, most schools of today are "well lighted."

Recommendations for the amount of foot-candles have been increased through the years, and new school designs and rehabilitation projects have featured increased intensities, in line with these recommendations. But as intensities have increased, it has become more and more apparent that increased intensity alone is not the entire solution, and that unwanted high brightness and contrasting low brightness must be avoided. Publications of the N.C.S.C.[1] and the A.A.S.A.[2] have had a salutary effect.

In spite of this increased awareness, many new school designs and many relighting projects still ignore the established and accepted principles on which a good visual environment is based. These principles are generally followed *to an extent* until they seem to conflict with a desired window design, a desired architectural effect, or a desire for "economical" light fixtures. Then they often are compromised or ignored.

Continuous fenestration has much to recommend it from several standpoints, but control of high brightness as seen through the windows is also important. Efficient light fixtures from the standpoint of lumen output also are desirable, but efficient and comfortable vision by avoidance of high surface brightness and reflected glare is even more important. It has not been demonstrated that design which provides controlled brightness is necessarily more expensive. It just takes a little extra thought during the design process.

The principles are fairly simple, but so important. The principles upon which a good visual environment is based are not complicated or hard to understand. Their application may involve technical matters, but the principles themselves are fairly simple. As stated in the 1958 edition of the N.C.S.C. "Guide for Planning School Plants," they are:

1. In a classroom, the brightness of any surface viewed from any normal standing or sitting position should not be excessively greater than the brightness of the *visual task*. As the high brightness of surfaces in the visual field approaches the *brightness* of the task, visual comfort and efficiency increase. Present research indicates that the highest acceptable brightness of any surface in the visual field should not be greater than 10 times the brightness of the task.

2. In a classroom, the brightness of any surface viewed from any normal standing or sitting position should not be excessively lower than the brightness of the visual task. As the low brightness of surfaces in the visual field approaches the brightness of the task, visual comfort and efficiency increase. Present research indicates that the lowest acceptable brightness of any surface in the visual field should not be less than one-third the brightness of the task.

[1]Guide for Planning School Plants, National Council on Schoolhouse Construction, 1958 edition, Pp. 213-227.
[2]Common Sense in School Lighting, the American Association of School Administrators, 1956.

3. The brightness of surfaces immediately adjacent to the visual task is more critical in terms of visual comfort and efficiency than that of more remote surfaces in the visual field. These adjacent surfaces have lower acceptable brightness limits than surfaces farther removed from the task. Present research indicates that surfaces immediately adjacent to the visual task should not exceed the brightness of the task.

4. The brightness-difference between adjacent surfaces in the total visual field should be reduced to an acceptable minimum.

5. The characteristics of any lighting system should be such that direct and reflected glare are not objectionable. If the brightness-differences produced by a lighting system are held within the limits stated in Principles 1, 2 and 3, direct and reflected glare will not be objectionable.

6. Daylight and electric light systems should conform to the same brightness and brightness-difference goals, and both systems should be coordinated in design to assure the effective contribution of both.

7. Any lighting system should be designed in such a manner that it will contribute to a cheerful, friendly and esthetically pleasing classroom environment.

These brightness principles, or goals, are based on 30 to 50 foot-candle levels. As foot-candle levels increase, brightness ratios should decrease.

In Principles 1, 2 and 3, note that the "task" is the reference point. Obviously, there are many tasks in any schoolroom. For design and evaluation of lighting systems, the N.C.S.C. adopts "a single reference task" as being "a horizontal working surface with a 70 per cent reflection factor located at the point of lowest light intensity in the schoolroom."

The nature of the task itself has much to do with its visibility. Black print on nonglossy paper, as used in most school textbooks, provides good visibility, in that there is maximum contrast within the task itself between the white paper and the black print. As the contrast within the task decreases, it becomes more difficult to see. Faded blue hectograph material obviously is more difficult to see than black print on white paper. Sewing on dark cloth with thread of the same color is another task having poor visibility.

An awareness on the part of teachers and others of the importance of good contrast within the task itself can do much to improve visual conditions. Blackwell's research, to be discussed later, proves this conclusively. A fundamental principle is that, for optimum visibility, there must be maximum brightness contrast within the task itself.

Principle 6 points out something which is often ignored, namely, that *all* light sources, whether electric light or daylight, should conform to the same brightness principles, and that the daylight and electric light systems should be coordinated. It would be pointless to design a perfect system of electric lighting and then to subject the occupants of a room to terrific glare from the outdoors. Yet some of the most recent buildings, designed by "leading" school architects, violate this, either through ignorance, carelessness or an overwhelming desire to have a certain external appearance above all other considerations. In one case, where an adjacent shiny bright wall is viewed through the windows, on bright days teachers wear sunglasses, children squint, and everyone seated on one side of the building realizes the thoughtlessness of this part of an otherwise good design.

If good visual conditions are taken seriously, and they should be, buildings must be designed in conformance with *principles* and not on the basis of hunches as to *what looks right.*

This advice does not imply that a school building should be designed in terms of visual conditions alone. Important as good visual conditions are, they are not the only important factor to be considered. Buildings must be comfortable thermally and acoustically. They must, above all else, be safe and healthful. They must also fit the program to be operated and be flexible to allow for program changes. They must be esthetically pleasing, attractive to children, friendly, interesting and inviting.

Budgets are limited. One must not spend all his money on lighting and ignore other factors, any more than one should spend too much on any room or department of a building to the detriment of others.

What is needed is an integrated, balanced design, with thoughtful consideration given to all factors and to accepted principles, including those on which a good visual environment is based. Sources of high brightness must be controlled, whether an incandescent bulb, cold cathode or hot cathode fluorescent, the sun, sunlight on an adjacent surface of a building, or a bright sky. Balanced brightness is the answer. It can be achieved economically with means now available.

There is no one solution — no one design or material that will solve the problem. Each building presents a separate challenge to creative and studious effort. The same daylighting design that worked in one situation may not work in another. The principles must be understood and observed if the desired results are to be obtained. If compromises must be made, and usually any school building contains compromises, they should be made in full knowledge of what is being compromised and why.

New materials, equipment, devices and gadgets must be evaluated in terms of how they affect the visual environment, not adopted because they are new or different

1. Fluorescent lighting. There is nothing wrong with fluorescence as a light source, but much can be wrong with the application of it. A few years ago when it was relatively new, it was hailed as the answer. Everyone had to have it. Bare tube fluorescent fixtures appeared in schoolrooms all over America. More light was obtained with the same current consumption, perhaps two or three times as much. But the brightness of a bare fluorescent

tube is from 1400 to 1900 foot-lamberts. With 30 foot-lamberts on the task, this involves ratios of from 45 to 65 to 1. Thus although there may be more light in the classroom, visual conditions are not improved.

Although it is now generally recognized that bare tube light fixtures should not be used, the fixtures which are in rather general use have still left much to be desired. Some have an average brightness as low as 300 to 350 foot-lamberts, but others are as bright as 1200.

The wisdom of anything less than complete shielding by a semi-indirect fixture is certainly questionable, in view of the research done by John M. Chorlton and D. M. Finch, which will be mentioned later in this study. Fluorescent lighting is a wonderful method of efficient light production, which can be used or misused, and it certainly deserves more intelligent treatment than it has often received.

2. Glass block. This is another useful tool which can be used or misused. This is the light directing type of glass block. It is true that this type of glass block does, by the use of built-in prisms, throw additional light to the interior of classrooms, and as such probably will increase the evenness of light distribution, especially if recommendations regarding such things as white ceilings and light colored walls are followed. But this is not a universal answer.

All the advantages and disadvantages should be studied. The material should be used intelligently to do a job and not adopted indiscriminately as a complete answer. How bright will a panel of glass block be at certain sun angles at certain times of the day or year? What atmosphere does this seem to lend to the room when the block is in the shade? Is it wise to restrict the view of the outdoors to a vision strip below the panel of blocks? Does the vision strip need shielding? Will the use of this material reduce heat loss in the winter? What about heat gain in warm climates during warm months? How can ventilation be handled? What advantages and disadvantages are there from the standpoint of maintenance? The directional glass block is a fine material. It can be used, and well used, but it should be used intelligently to solve a particular problem.

3. Low transmission glass. This is another very useful tool. Properly used as part of a total design, it can reduce excessive brightness as seen through the windows and still provide a view of the outdoors. I have seen it used very well as a part of a total design. I have seen almost ideal visual conditions in some classrooms where it is used, but it should not be used everywhere. It has been used in window areas where no shielding against high brightness is needed because such shielding already is provided by overhangs or other means.

There is no panacea; there is no one design, whether it be clerestory lighting, top lighting or bilateral lighting, which can be used everywhere. There is no one electric lighting method; incandescent, hot or cold cathode fluorescent, cove lighting, ceiling of light, troffer lighting, spot lighting, electroluminescence, polarized lighting, or any other, which can be used indiscriminately. All are good if properly used, or are bad if used unintelligently.

The same is true of various methods of shielding against high brightness from outdoors. Interior louvers, exterior louvers, "jib walls," vertical louvers, Venetian blinds, draperies, roller shades, sun screens — all are good at times in the right place. All are bad if used as the *one* answer. They must all be evaluated in terms of the particular application proposed and on the basis of the principles for a good visual environment. Both the designer and the client must understand these principles and be willing to study their application. ■

WILFRED F. CLAPP . . . assistant superintendent, administrative services, Michigan State Department of Public Instruction . . . with the department since 1939 . . . superintendent, Ovid (Mich.) public schools from 1931 . . . teacher there from 1925 . . . past president, National Council on Schoolhouse Construction . . . a representative of the Council to the Joint Task Committee.

GLOSSARY

Foot-candle — the unit of measure of light intensity.
Foot-lambert — the unit of measurement of brightness.
Candles per square inch — another unit of measurement of brightness, usually employed to measure the brightness of a light source, such as a lamp or light fixture.
Brightness — the luminous intensity of any surface. Brightness is created either by reflection or direct transmission. The average brightness of a reflecting surface in foot-lamberts is the product of the illumination in foot-candles and the reflection factor of the surface. FC × RF = FL.
Reflection factor — reflection expressed as the percentage of the total amount of light falling on a surface which is reflected by that surface. Light colors reflect a high percentage of the light falling upon them; dark colors reflect a low percentage.
***Glare** — the effect of brightness or brightness differences within the visual field sufficiently high to cause annoyance, discomfort or loss in visual performance.
***Direct glare** — glare resulting from high brightness or insufficiently shielded light sources in the field of view, or reflecting areas of high brightness and large area.
***Reflected glare** — glare resulting from specular reflection of high brightness sources in polished surfaces in the field of view.
Task — any visual task which may be encountered in a schoolroom; for example, a book on a desk, symbols on a chalkboard, demonstration or experimental apparatus in a laboratory, an object being worked on in a shop.

*Taken from the Illuminating Engineering Society Handbook, third edition, Section 3, p. 12. Other definitions are taken or adapted from the National Council on Schoolhouse Construction "Guide for Planning School Plants," 1958 edition.

RESEARCH

Research establishes proper ratios for brightness contrast, need to shield all light sources, and methods and materials to minimize glare

C. L. CROUCH

THE concept of a suitable visual environment for quick, accurate seeing has come from research. The eye is remarkably adaptable. It can continue to operate, even at a reduced capability, over a tremendous range of environmental conditions. The conditions for optimum visual performance can be determined only in the laboratory.

Many tests have been conducted, but two studies have served as a basis for the recommendations of the National Council on Schoolhouse Construction in its "Guide for Planning School Plants." The conclusions from these studies appear in the Illuminating Engineering Society's report entitled "Brightness and Brightness Ratios" in December 1944.

In this report it is indicated that the brightness of the surroundings of a visual task (book, pencil work, drawing) should be not greater than three times the brightness of the task itself, or less than one-third the brightness of the task. For ideal conditions the brightness of the surroundings should be equal to that of the task. This report indicates that these values applied more particularly to a limited cone of vision and infers that higher values might be permissible at locations more remote from the line of sight.

Later the office and school committees of the I.E.S. re-evaluated the researches upon which these conclusions had been reached and set up a pattern of brightness ratios for practical design. This involved a relationship of the brightness of the task to that of the immediate surroundings in the proportion of one to one-third and between the task and more remote surroundings of one to one-tenth or one to 10. (See Fig. 1.) The latter ratios were considered as limits beyond which brightness variations should not go for efficient seeing.

All of the foregoing recommendations were based largely upon two researches: one by P. W. Cobb in 1916 and the other by R. J. Lythgoe in 1932. Dr. Cobb investigated the effect of different surroundings upon the ability of the observer to see contrast. He viewed a small test spot against its background. Surrounding the test field was an illuminated area that could be varied in brightness, independent of the test field.

When the brightness of the surrounding area was equal to that of the test field, the eye could see the smallest degree of contrast. As the surrounding area became less or greater in brightness than that of the test field, the eye could see less and less degree of contrast.

Dr. Lythgoe's research was on the effect of surroundings upon visual acuity (ability to see fineness of detail). A symbol, similar to a letter on a Snellen eye chart, was used; it was black upon a white background. Just like seeing lower and still lower lines of letters on the eye chart, the observers were able to see smaller and smaller

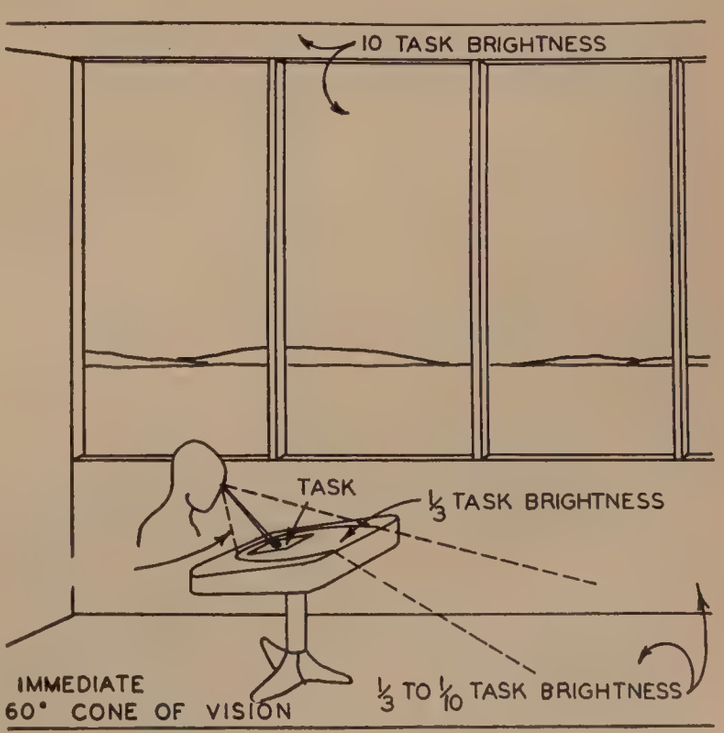


FIG. 1. Shown here are recommended ratios between brightness of task and brightness of surrounding field.

detail as the surroundings approached the same brightness as that of the chart. As the brightness of the surroundings became more divergent with that of the task, the greater the size of the letter that could just be distinguished.

Thus the same trend was found in distinguishing fineness of detail as was noted in Dr. Cobb's research on contrast. In 1955, W. R. Stevens and C. A. P. Foxell reported a more comprehensive study that strongly confirmed Dr. Lythgoe's findings.

The I.E.S. committees examined the Cobb and Lythgoe curves and decided that ratios of one to one-third did not entail much loss of either contrast or acuity; therefore, this value could be used for practical application to the immediate surroundings of the task. Pursuing this reasoning still further, it was judged that a one to one-tenth or a 10 to one ratio entailed enough loss to make it the outside limit for variations between the task and peripheral surroundings remote from the line of sight.

All of the foregoing research and application has to do with fixed viewing of a stationary test object. Recently the Technical Advisory Committee on Light and Vision of the Illuminating Engineering Research Institute questioned the applicability of stationary viewing to working environments where dynamic or moving-eye vision is involved. As a result, a study was set up at the University of Rochester under the direction of R. M. Boynton.

While the study has not been completed, the first results generally indicate a confirmation of the foregoing studies. Thus as one looks away from the task to an area of lower brightness (floor or blackboard), there is a decrease in ability to see detail and contrast. Likewise, as one looks away from the task to an area of higher brightness (ceiling, windows, luminaires), there is a similar loss of capability.

A good design begins with attention to specific detail. I shall now discuss in greater detail significant research pertaining to (1) the task, (2) the immediate surroundings of the task, (3) the more remote surroundings, (4) the glare sources in the surroundings, (5) the glare on the task, and (6) the "pepping up" of the whole interior to make it a pleasant place to study and work.

A good design starts with a focal point. The focal point is the work to be seen. The rest of the design (the elimination of glare and the proper brightness balance of surrounding areas) must supplement the carrying out of that work at the focal point. Here the age-old question is: "How much light is necessary to see the work?"

H. Richard Blackwell of the University of Michigan,[1] sponsored by the Illuminating Engineering Research Institute, has supplied the basic method by which to determine the light necessary for seeing any field task in the workaday world.[2] As Dr. Blackwell has determined, it is the amount of light necessary to see the detail of the work under moving-eye conditions and with a pause for fixation of the detail of one-fifth of a second needed by the unhurried eye.

This method is based strictly upon visibility and does not embrace the optimum rate of seeing or evaluate maximum ease or minimum effort. These latter items come later in the research program when suitable criteria can be developed with enough sensitivity and reliability to give repeatable and irrefutable results. Research has good indications in these directions. Scientists will not be satisfied until they obtain complete knowledge of the relationships of all factors that contribute to maximum speed, efficiency and ease of seeing.

Blackwell reports on the plain visibility of the task. For his experiment, Dr. Blackwell used young adult observers with normal or normally corrected vision. They recorded the visibility of a standard test object, which was a luminous disc of varying size and contrast, when seen against a background of varying brightness. The experiment was conducted in a large uniformly bright controlled cubical. (See Fig. 2.) The measurements covered sizes ranging from an extremely tiny spot of one minute to 64 minutes corresponding to large detail.[3] The time interval of viewing varied from one-thousandth second to one second, and the brightness of the background changed from .001 to 350 foot-lamberts.

After determining how the eye sees a standard test object, it was necessary to relate the laboratory data to field conditions of "moving" eyes and the differing detail of various school tasks. The "moving" eye factor was determined by observing detail on a large moving wheel that passed in front of the observer. (See Fig. 3.)

The relation of various school tasks to the standard luminous disc was determined by varying the contrast of the luminous disc until it was equally visible, through an optical instrument (contrast threshold meter called the "visual task evaluator"), to the given school task. Once the equivalence was established, the laboratory data, with the moving-eye factor included, could be used to determine the illumination necessary to see the task at a given rate of performance. This rate of performance was based upon a complete degree of accuracy and an eye pause of one-fifth second, found to be the average pause of the eye in reading and scanning.

The resulting measurements indicated that tasks of comparative size having good contrast required low levels of illumination; those tasks having poor contrast needed much more illumination than the proportional decrease in contrast.

The Joint Task Committee on School Lighting thought that writing with a No. 2 pencil on matted white paper could be considered the commonly found and more dif-

[1]Dr. Blackwell is now director, Institute for Research in Vision, Ohio State University Research Center.

C. L. (CASH) CROUCH . . . technical director, Illuminating Engineering Society since 1944 . . . secretary and technical adviser to Illuminating Engineering Research Institute from 1945 . . . industrial lighting and special application engineer in industry from 1936 . . . engineering consultant on special signaling problems, Bureau of Ships, U.S. Navy, during war years.

[2]Blackwell, H. R.: Development and Use of a Quantitative Method for Specification of Interior Illumination Levels on the Basis of Performance Data, Illuminating Engineering 54: 317-353 (June) 1959.

[3]Angle expressed in minutes of arc subtended at the eye by the size of the critical detail. For instance, on an eye chart the width of the stroke of the letters on the 20/20 vision line subtends a visual size of one minute of arc at the eye 20 feet away.

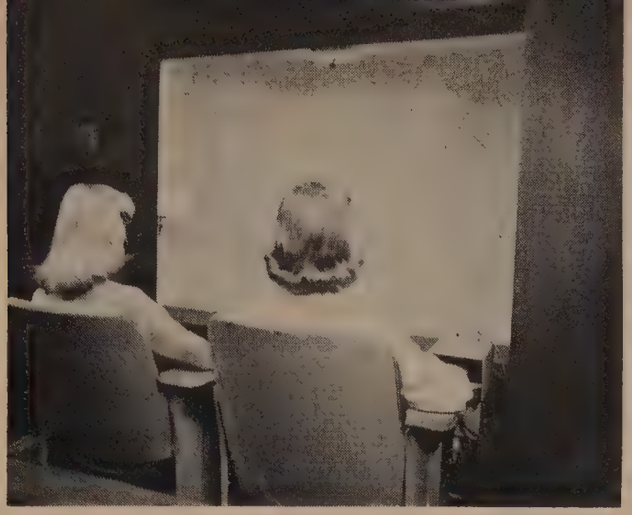


FIG. 2. Normal young adults measure relationships of size, contrast, time and accuracy of seeing a luminous disc — all varying with various levels of brightness in the cubicle.

FIG. 3. Study of factor between static laboratory conditions where observer knew just when and where object would appear and the usual dynamic eye-movement conditions in performing work tasks. The wheel simulates a field operation where eye must scan the detail to be seen.

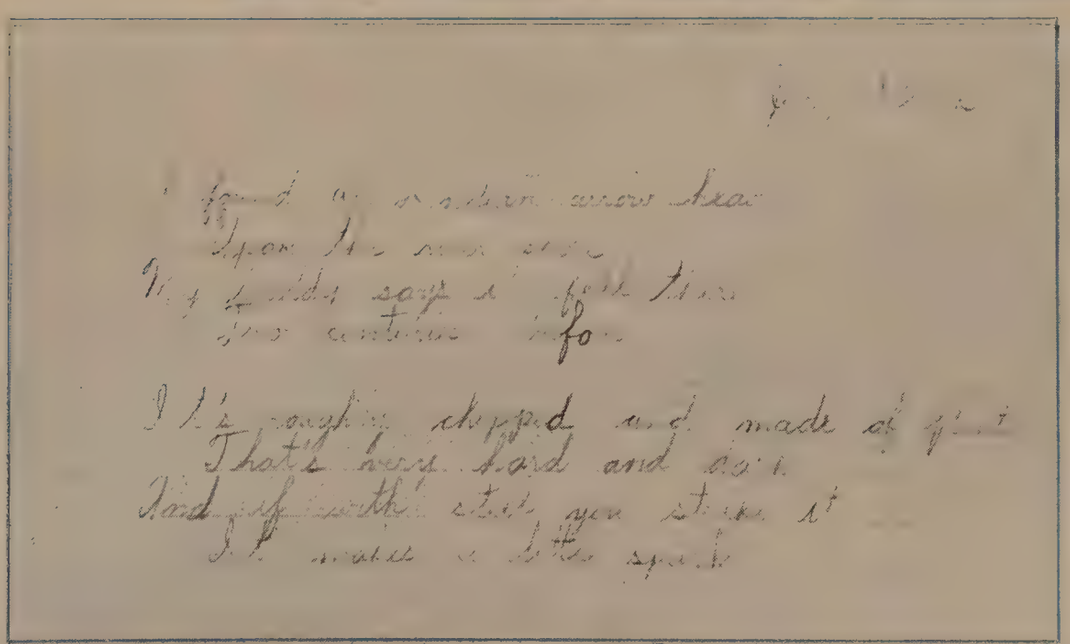


FIG. 4. This sample is typical of the handwriting of 31 pupils in Grade 6 in a Toronto, Ont., school. No. 2 pencils were used on a soft finish paper. This task, under these specific circumstances, required 63 foot-candles illumination.

ficult visual task in the classroom. Accordingly, John M. Chorlton of the Toronto board of education obtained 31 samples of handwriting from sixth graders and sent them to Dr. Blackwell for measurement by the visual task evaluator. Of the 31 samples, 12 (40 per cent) were grouped together toward the lower range of visibility because of poor contrast. The average sample indicated the need of 63 foot-candles.[4] (See Fig. 4 for the average sample handwriting.)

Blue printing on duplicated forms reduces contrast. Widespread or increasing use of spirit-duplicated (hectograph and so forth) material for exercises, work sheets, examinations and reference material has made it an important segment of the visual tasks. The contrast of the blue typed or written characters is greatly reduced as compared with black and white characters and, accordingly, much more illumination is needed. While the first copies may be quite good, it was found that the average run of samples taken from two school systems was poor.

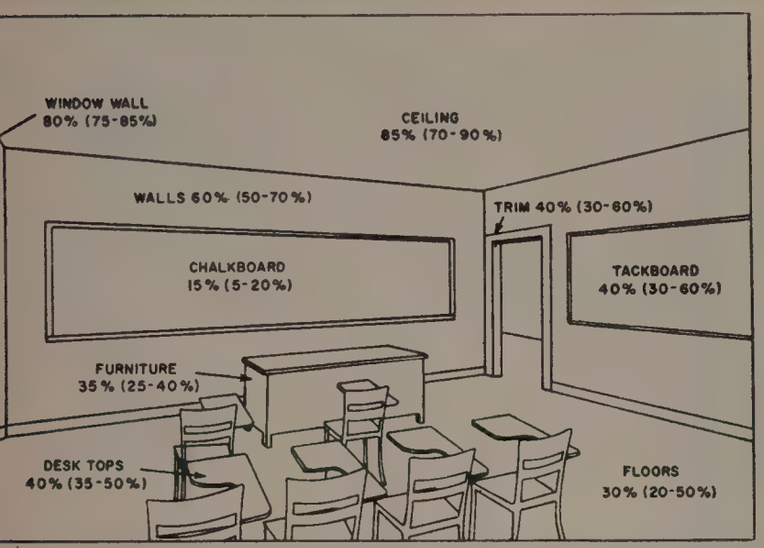


FIG. 5. Recommended classroom reflectances

The range of measurements varied greatly from a few foot-candles to several hundred foot-candles. The median was 128 foot-candles.

Printed material (black on white) has good contrast. Dr. Blackwell's measurements showed a range from 0.6 to 3.0 foot-candles. Thus if all visual tasks could be made to have good contrast, much less light would be needed. Since changes of contrast make a great difference, effort should be made to provide as good a contrast as possible by improving reproductions and using ink rather than pencil. However, designers of illumination must consider the actual tasks found in the school and provide the proper light for these tasks. Unless assurance is given by the school administrator that only contrasts comparative to black and white will be used, the school lighting should be designed for the "commonly found, more difficult tasks." From this point of view, pencil work or average hectographed material might well be considered as the appropriate tasks for determining the illumination needed.

After determining at the focal point, one next considers the portion of the environment that affects the ability to see the task. Here I depart from illumination and deal with brightness. Illumination, or the amount of light on the task, may or may not be seen, depending upon whether the task reflects light. Dark colored materials may absorb much light and the observer will not be conscious of the magnitude of light there.

However, the most common tasks in the ordinary classroom are on light colored materials; therefore, most of the light is reflected to the eye of the observer and tasks appear bright. Pencil work on white paper has an average reflectance of about 70 per cent. With 70 foot-candles on the task, the brightness would be about 50 foot-lamberts (70 times 0.7).

The task (pencil work, hectographed or printed material) lies on a desk and the desk stands upon the floor. What effect, according to research, has the brightness of the desk and the floor upon the ability to read the paper?

Surroundings clearly influence ability to see detail. Research on visual acuity (ability to see fine detail) by R. J. Lythgoe,[5] and later by W. R. Stevens and C. A. P. Foxell,[6] and research on ability to see small degrees of contrast (contrast sensitivity) by P. W. Cobb,[7] indicates that if one is looking fixedly at a given detail, the brightness of the immediate surroundings influences one's ability to see that detail. When the brightness of the task and the surroundings is equal, one has the maximum ability to see detail and contrast. When the brightness of the immediate surroundings is one-tenth the brightness of the task, or 10 times brighter than the task, there is an appreciable loss of visual acuity and contrast sensitivity. If surroundings are one-third the brightness or three times brighter than the task, the loss is not great.

The foregoing is for static viewing. I mentioned earlier the work being done by R. M. Boynton of the University of Rochester pertaining to the effect on seeing when the eye moves from one brightness area to another, thus involving transitional adaptation.[8] In going from the brightness of the task (40) to one-tenth the brightness (4), the momentary contrast had to be increased by 70 per cent over what it would need to be if the eye had been adapted completely to the lower brightness.

If the eyes are moving about, as in regular practice, and the pauses for fixation are only one-fifth second, there isn't enough time to adapt completely to the new brightness areas being perceived. Therefore, the ability of the eyes to see low values of contrast may be handicapped severely. The same trend holds true if one goes from a lower brightness to a higher one.

While the limiting brightness ratios (or brightness dif-

[4]A foot-candle is the unit of light on a task. It is equal to the amount of light on a surface 1 foot away from a standard candle.

[5]Lythgoe, R. J.: The Measurement of Visual Acuity, Report No. 173, Medical Research Council, H.M. Stationery Office, London, 1932.

[6]Stevens, W. R. and Foxell, C. A. P.: Visual Acuity, Light and Lighting. 48:12 (December) 1955, Pp. 419-424. (A publication of the Illuminating Engineering Society, London.)

[7]Cobb, P. W.: The Effect on Foveal Vision of Bright Surroundings, Journal of Experimental Psychology. Vol. 1, 1916, p. 540.

[8]Boynton, R. M.: Unbalanced Lighting — Its Effect on Visual Performance. A paper presented at the third Research Symposium of the Illuminating Engineering Research Institute, Washington, D.C., March 1960.

ferences) are the objective of the proper visual environment, the means of accomplishing it lie largely in the use of suitable reflectances on the furniture and surfaces of the room. It has been found that with direct-indirect lighting (approximately 50 per cent of light up and 50 per cent of light down) and with indirect lighting (90 to 100 per cent up), the distribution of light, together with the recommended reflectances, gives suitable brightness ratios with electric lighting alone. (See Fig. 5.)

Completely direct lighting (90 to 100 per cent light down) from narrow troffers (luminous troughs flush in the ceiling) or individual incandescent small area units will not light adequately the ceiling and, in some cases, the side walls, to meet the proper ratios. Besides, these units may cause a high degree of reflected glare unless the distribution cuts down the light in the potential glare zone.

Also the distribution of daylighting may be largely nonuniform; therefore, the ratios may not hold true. Careful daylighting control should be designed to provide the proper ratios.

Evaluating the effect of glare sources in the visual environment has been another research approach. In 1925 L. L. Holladay reported the first meager study of discomfort glare.[9] This was used as a basis for recommendations of brightness limitations of lighting units in 1942. Since then S. K. Guth[10] in the U.S.A. and R. G. Hopkinson[11] in England have led the way in evaluating various phases of discomfort glare.

Jack M. Fugate and G. A. Fry at Ohio State University studied the physiological basis of discomfort glare.[12] They reported that the feeling of discomfort was related to the closing of the pupillary opening as the eye attempted to protect itself against too bright a source.

Dr. Guth investigated the glare effect of the size of the glare source, its position in the field of view, and the field brightness against which the glare is being seen. With all these relationships determined, it is possible to develop an approximation of the total discomfort glare effect in any room. The Task Committee used this research information to study its application to rooms varying in size from 10 by 10 feet to 100 by 100 feet.

Graph shows over-all criterion for any classroom size. Since schoolrooms vary widely in size, and partitions are movable, it was possible to develop an over-all criterion that would make lighting units conforming to it applicable to any room size. This criterion was put in the form of a graph in which two straight lines cross at a point near one side; it thus has earned the appellation of "scissors curve." (See Fig. 6.)

The horizontal line represents the condition where lighting units are uniform in brightness appearance, such as white glass globes, white glass cylinders, or flush ceiling-mounted reflectors having white glass or plastic in the bottom, which look uniformly bright from any direction. The horizontal line is located at the value of 250 foot-lamberts brightness. Thus any uniformly bright luminaire should never exceed 250 foot-lamberts as viewed from the horizontal line to 45 degrees above the horizontal line of sight.

The other line represents the maximum non-uniformity that a lighting unit can have without glare.

(*Continued on Page* 130)

[9]Luckiesh, M., and Holladay, L. L.: Glare and Visibility, Transactions of the Illuminating Engineering Society 20:221 (March) 1925.

[10]Guth, S. K., and Luckiesh, M.: Brightnesses in Visual Field at Borderline Between Comfort and Discomfort (B.C.D.), Illuminating Engineering 44:650 (November) 1949. Guth, S. K.: Quality of Lighting, Illuminating Engineering 50:279 (June) 1955. Comfortable Brightness Relationships for Critical and Casual Seeing, Illuminating Engineering 46:65 (February) 1951. Subjective Additivity of Areas of Brightness, Proceedings of the International Commission on Illumination, Zurich. Vol. 1, (June) 1955.

[11]Hopkinson, R. G., and Petherbridge, P.: Discomfort Glare and the Lighting of Buildings, Transactions of the Illuminating Engineering Society, London, Vol. 15, No. 2, 1950, p. 39.

[12]Fugate, Jack M., and Fry, Glenn A.: Relation of Changes in Pupil Size to Visual Discomfort, Illuminating Engineering 51:537 (July) 1956.

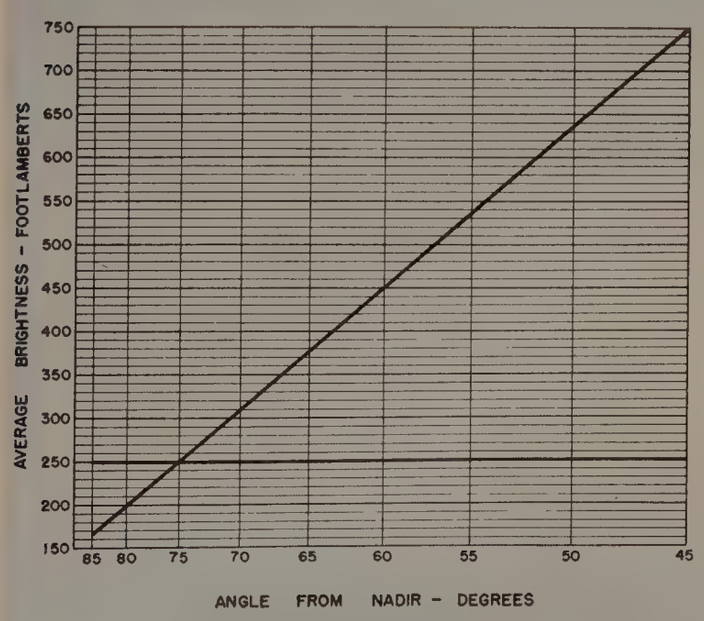


FIG. 6. Direct glare limiting brightness guide — the "Scissors Curve."

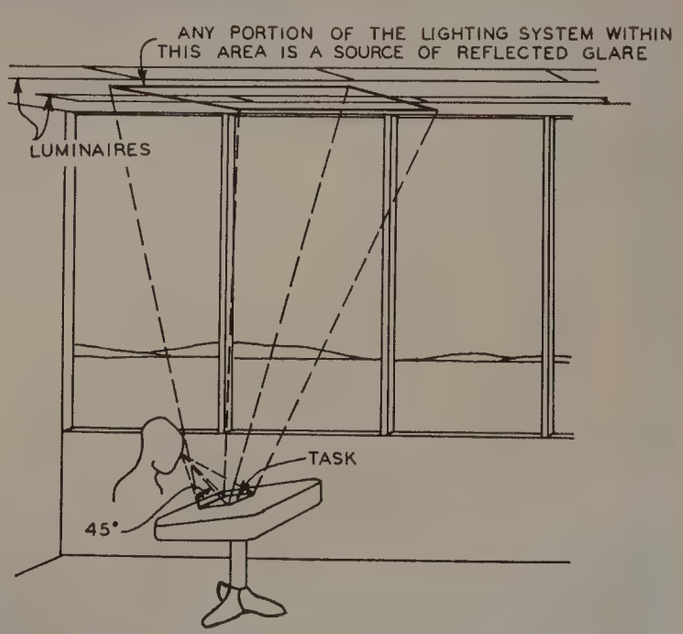


FIG. 7. Zone in which reflected glare occurs from overhead lighting.

Research shows serious waste of light under glare conditions. School visual tasks should offer high contrast

JOHN M. CHORLTON

MOST visual tasks are seen by reflected light; very few are self-luminous. The reflected light may cause a task to be barely visible or easily visible. Some objects are more difficult to see than others. Why is this true? What determines the visibility of an object?

As a result of two separate, but coordinated, researches sponsored by the Illuminating Engineering Research Institute, many of these questions can be answered. The researches were performed by D. M. Finch at the University of California, Berkeley, and J. M. Chorlton and H. F. Davidson in the Toronto, Ont., schools.

It is now known that the special distribution of reflected light has a great deal to do with visibility. The reflected light flux, which causes the task to be visible, originates in light sources that are disposed in space around the object while the observer views the object from a particular location. Thus the geometry of the lighting system that relates all of the directions, distances and dimensions is an important factor.

The physical characteristics of the task are another important perimeter. It has been determined that changes in visibility occur when visual tasks are viewed under various lighting conditions, even though the illumination at the task may be constant. These changes in visibility are related to the change in the brightness patterns and the contrasts that occur.

The work done in Toronto by Dr. Chorlton and Dr. Davidson answers many of the questions involved in geometry and spatial distribution. The experiments conducted there indicated an appreciable loss in contrast with some tasks due to specular reflections. D. M. Finch, in California, measured the physical characteristics of the task. Using the Finch technic, it is possible to calculate losses in visibility due to specular reflections.

Characteristics of Tasks. Many visual tasks have surface characteristics that are partially glossy. Because of this, they have a relatively high reflectance in directions close to the mirror angle with respect to the incident light. One such task is pencil writing on matted white paper. The pencil strokes exhibit partial specular reflection. Thus, if an appreciable amount of the light on the task is from the direction of mirror reflection, the bright-

(*Continued on Page* 134)

JOHN M. CHORLTON . . . superintendent of maintenance and construction, Toronto, Ont., board of education . . . chairman, Committee on School Lighting, Illuminating Engineering Society . . . chairman, Joint Task Committee on School Lighting . . . Canadian regional vice president, Illuminating Engineering Society.

PRINTED SAMPLES illustrate the importance to seeing of paper texture and the angle of the light source. The paper under the microscope is rough and appears as many ups and downs (bumps). When the ink is pressed onto the paper, it, in turn, is not flat, but is a series of mirrors located on different planes and therefore is reflecting light to the eye at many different angles. All four samples are printed on coated book stock and each shows a 115 degree viewing angle (an angle subtended by a line from the eye to the paper and from the paper to the light source). Top illustration shows 90 degree incident light (light above the work). Second illustration shows 65 degree incident light — specular angle. In third illustration incident light is 40 degrees, while bottom illustration shows a 5 degree incident light.

Architects, engineers and educators seek agreement as

Task Force Interprets Lighting Research

TWO groups are involved in the field of classroom illumination.

One is a group of architects and engineers, who, working together, use their technical learning and experience to construct an efficient and economical plant that creates an environment in which children can learn comfortably and make maximum educational progress. The other is a group of educators having technical learning and experience in the field of educational programing and school administration. Through their teaching technics, they, too, create an environment for learning and educational progress.

Each group must, of necessity, have some understanding of the other's aims and methods. How these two groups work together determines whether a particular schoolhouse is built successfully to meet the aims of education today.

Administrator Needs Advice

The administrator and his staff are responsible for the educational program conducted *within* the school plant. The educator cannot, however, presume to tell the architect and the engineer how to create the desired environment. On the other hand, because there are so many considerations of policy and costs, the educator cannot accept all technical proposals without some evaluation in terms of his own school system and program. The educator, therefore, looks to groups such as the American Institute of Architects, the National Council on Schoolhouse Construction, the Illuminating Engineering Society, and others to provide him with some criteria for evaluating the advice from his architects and engineers.

Eight years ago it was decided that architects (A.I.A.), illumination and vision specialists (I.E.S.), and educators (N.C.S.C.) should work jointly to produce a document that could give the needed guidance in the field of illumination. Consequently, representatives from each of these professional organizations have formed what has become known as the "Task Committee on School Lighting." The purpose of the committee has been to prepare a guide or document, on which all would agree, that would be used for the design of a visual environment. It is hoped that the document will be ready for public distribution this year.

From the start, it was agreed that any recommendation made by the committee must be based on research and proven experience. The committee found that there already existed a large fund of research that permitted informed recommendations, but there were many areas in which little or no research had been done. The committee, therefore, initiated research to meet particular demands for information. Other researches were expanded. The result of the work of the Task Committee will be a document that will be highly useful to all persons connected with or interested in classroom illumination.

The recommendations of the committee will deal with these six large areas:

1. Recognition of principles of illumination and use of brightness ratios in design.
2. Control of direct glare from light sources.
3. Control of glare reflected from the task.
4. Adequate levels of illumination for various tasks.
5. Recognition that all sources of illumination (daylight or electric) must meet the same design criteria.
6. Need for flexibility in design and necessity of coordinating visual, auditory, thermal and structural environments.

Each of these areas is discussed elsewhere in this lighting study.

In preparing this guide, the representatives of the three organizations have been able to form an uncommon understanding of the others' points of view. The result certainly will be a guide most useful in all respects.

Those Who Serve

Members of the Task Committee:

Representing I.E.S. — John M. Chorlton, Toronto board of education, Toronto, Ont., chairman; C. L. Crouch, technical director, Illuminating Engineering Society, New York City; Everett Strong, department of electrical engineering, Cornell University, Ithaca, N.Y.

Representing the American Institute of Architects — Eric Pawley, research secretary, A.I.A., secretary; Henry L. Wright of Kistner, Wright and Wright, architects, Los Angeles; John W. McLeod of McLeod & Ferrara, architects, Washington, D.C.; Frank Lee Cochran of Perkins & Will, architects, Chicago; Foster K. Sampson, electrical and illuminating engineer, Los Angeles, consultant to the committee.

Representing the National Council on Schoolhouse Construction — Charles D. Gibson, chief, bureau of school planning, California State Department of Education; James L. Reid, supervisor, school plant planning, Maryland State Department of Education; Wilfred F. Clapp, assistant superintendent, administrative services, Michigan State Department of Public Instruction.

— JOHN M. CHORLTON

DESIGN

Glare can be designed out of schools by controlling the sources of high brightness and the reflection from walls, floors and other interior surfaces

HENRY L. WRIGHT
FOSTER K. SAMPSON

CLASSROOM design involves several environmental factors, such as the thermal, auditory, visual and esthetic qualities of the finished product. For successful solutions to good schoolroom planning, all of these qualities must be considered carefully in relation to each other.

Of the several factors influencing the total classroom environment, adequate lighting, from either daylight or electric sources, is probably the most difficult to obtain while keeping the other factors in balance. Too often, poor total designs have resulted from emphasis on one factor without due regard for the others.

Modern technology and the great number of materials now available provide the designer with numerous possibilities for solutions that satisfy the principles of good lighting.

Nearly all paint manufacturers now supply the reflectance values of every standard color of paint on the market, and it is possible to establish in advance the reflectances of any hue desired. The selection of *flat* paints and varnishes is essential so that the finished surfaces have little or no specular or mirror reflection.

Chalkboards are available in a variety of colors that come within the limits of recommended practice. The traditional brown cork carpet tackboards may now be replaced with integrally colored cork or cork covered with vinyl plastic fabrics. Both of these materials are available in a wide variety of colors.

Acoustic tile for walls and ceilings is available in factory finishes that meet the high reflectance values required for ceiling surfaces.

Floor coverings of many kinds are available within reasonable price ranges and with colors that meet the recommended reflection factors.

All of these and many other finish materials are at the disposal of the architect when he plans a school building.

In his discussion of principles, Wilfred Clapp quotes seven basic objectives of good visual environment as established by the National Council on Schoolhouse Construction (page 76). These seven principles are the result of many years of experience with various lighting systems and in observing student and teacher reactions to actual teaching spaces constructed in the U.S. and elsewhere.

The first of these principles, paraphrased, is: *The brightest surface within the visual field should not be greater than 10 times the brightness of the task.* This means that no area of brightness, whether it be windows, walls, ceiling or lighting fixtures, should have a brightness of more than 10 times that of the task. Since some teaching technics make it advisable for pupils to be seated in informal arrangements, *all* of these surfaces come within the direct visual field of some of the children. Careful consideration must be given to the color and reflectance factors of the walls, ceiling and floor. Windows should be shielded in some manner so that reflections from an excessively bright sky and from adjacent structures do not cast a glare into the room. Electric lighting systems should be designed to have low surface brightness when lights are turned on.

The second objective states: *The lowest acceptable brightness of any surface in the visual field should not be less than one-third the brightness of the task.* The two major areas that might violate this objective are the floor and chalkboard. In each case, available materials that will comply with the objective can be selected.

Another objective is: *The brightness-difference between adjacent surfaces in the total visual field should be reduced to the minimum.* That is, there should not be violent differences of contrast or color between any two adjacent surfaces. Examples of poor practice are black trim around chalkboards, tackboards adjacent to light walls, and bright spots of light in the ceiling that result from skylights or recessed lighting fixtures. Chalkboards often present a problem if they are too dark in color; however, a board of 25 per cent reflection factor is satisfactory even on a wall with a 75 per cent reflection factor.

To translate the foregoing criteria into the design of buildings and the surfaces and treatments of ceilings, walls and floors should be as follows:

Ceilings. Any color selected for the ceiling should have a reflection factor of not less than 80 per cent. The ceiling surface is most important for both daylighting and electric lighting because it serves as the principal reflecting surface in the room. One of the most satisfactory lighting systems (to be explained later) that meets the goals depends primarily upon light that is reflected from the ceiling. Also, the most effective daylighting comes through the windows to the ceiling and is then reflected throughout the room. A flat white paint is recommended for ceilings; if color is desired it should be an extremely light pastel.

Walls. Finished surfaces of walls should have a reflectance factor of not less than 60 per cent. Walls receive light from the windows, ceiling and lighting fixtures and in turn reflect the light to the task. Walls should be a little darker than the ceiling to develop a transition between the walls and floor, and between the walls and chalkboard. Accent colors should be used with discretion and only on small surfaces, such as doors, cabinets and other equipment. Flat paint should be used throughout. Avoid glossy enamels and shiny metals; these produce specular reflections that are not acceptable in the visual field. Because of the wide range of colors available, the designer has ample opportunity to create an interesting and pleasant space and stay within the limitations already described. Classrooms colors need not be bland and flat; there is ample opportunity, by wise use of color, to create a cheerful and colorful environment.

Floors. Since floor surfaces are located within the immediate visual field, a color should be selected that reflects not less than 25 per cent. Many floor covering materials are now available, both in color and at an acceptable cost, which fall well within this limitation. Lighter floor coverings are easier to maintain.

Windows. Probably the most difficult problem to solve is window treatment. Windows are a necessary function of a pleasant environment. They are used as vision areas; students can see beyond the wall enclosures. They are used for ventilation; they are used as a light source, and they are important to architectural treatment both inside and outside.

Since all daylight comes from windows or skylights, some kind of treatment to shield excessive exterior brightnesses is needed. The designer has a limited choice of shielding devices and he must have a thorough understanding of the principles of glare control.

Fixed and operable louvers have been placed outside and away from the windows, with the blades set at the proper angle to shield the sky from view. Combinations of roof overhangs and trees and shrubs have been satisfactorily employed. Clear and low transmission glass has been used successfully in the same windows by shielding the view through the clear glass by roof overhangs. In that part of the window not shielded by the roof, low transmission glass reduces the apparent brightness of potential glare sources viewed through the windows.

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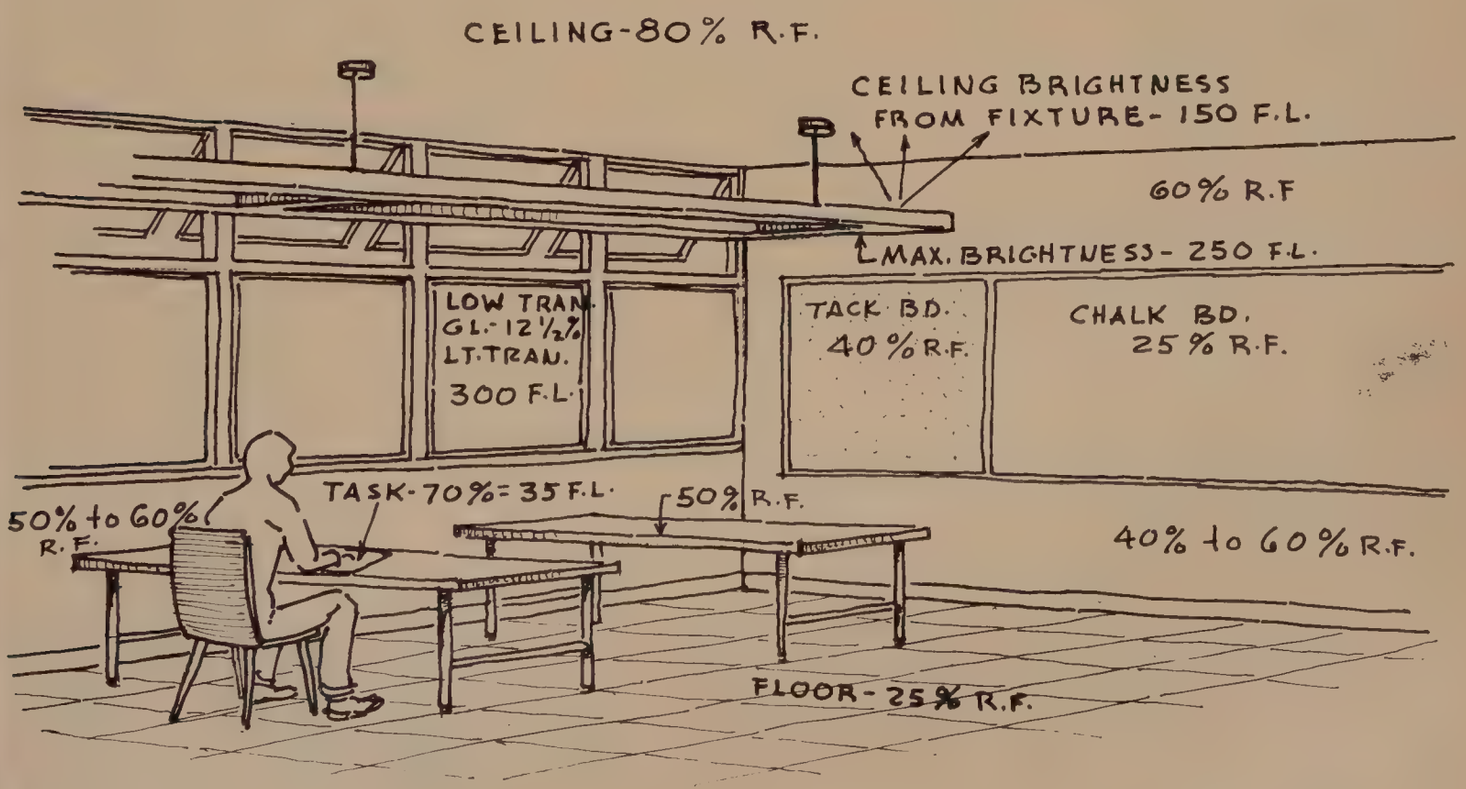

CLASSROOM illustration shows recommended reflectance factors (R.F.) of surfaces within the visual field and the brightnesses of task, windows and lighting fixtures as expressed in foot-lamberts (F.L.), assuming an intensity of 50 foot-candles. Foot-candles (F.C.) times reflectance factor (R.F.) equals foot-lamberts (F.L.).

Adequate lighting is most difficult to obtain while keeping other factors in balance, but with know-how it can and must be done

Combinations and variations of these principles have been used successfully to provide a balanced visual environment, well within the recommended brightness ratios.

Skylights. Daylight from skylights and plastic domes is used frequently as the only source of daylight, or it is used in combination with windows to distribute daylight uniformly throughout the classroom. Particular caution should be exercised with this system because if the brightness of these sources is not controlled, excessive direct and reflected glare will result. The same principles of brightness ratios hold true for windows or electric lighting fixtures. The reflected daylight within the room should illuminate the ceiling so that the brightness difference between the ceiling and the daylight source is not objectionable. Skylights and plastic domes often are subjected to direct sunlight as well as to diffused light from the sky. Therefore shielding devices are required either above the roof or at the ceiling level if these sources are to be brought into reasonable balance.

Ceiling Heights. It has been demonstrated repeatedly that a 12 foot ceiling height is required for daylighted classrooms where the light source is from windows. Also a bilaterally lighted system is essential if adequate intensities are to be obtained.

In recent years there has been a tendency to reduce ceiling heights for reasons of economy and to provide a teaching space closer in scale with children. Skylights or plastic domes may be used to augment light from windows if ceilings are lowered. In determining lower ceiling heights the electric lighting system should be considered, since mounting heights of luminaires of the system selected will be a governing factor. In many instances, rooms having 9 foot 6 inch to 10 foot ceilings have accommodated the installation of completely satisfactory electric lighting and daylighting systems.

Audio-Visual Considerations. Any discussion of classroom lighting should include audio-visual requirements. The universal solution to this is darkening the room with curtains, shades or Venetian blinds. Specialists in the field of teaching aids continue to recommend almost complete darkness and fairly large conventional screens for movies, slides, filmstrips and so forth. Yet, the teacher can better control discipline, watch the reaction of the pupils, and carry on a more normal instructional program if the room is in semidarkness, thereby receiving the most use from these teaching aids. The growing interest in television emphasizes the importance of providing proper visual conditions in the classroom for a wide variety of situations.

If a smaller image could be accepted and a slight rearrangement of desks or tables and chairs could be employed while using such aids, present available equipment could be used satisfactorily in some of the present daylighted classroom solutions.

In buildings designed with electric lighting as the primary light source and where smaller windows have been included for architectural and psychological reasons, the illumination levels from daylight seldom exceed 10 foot-candles. Under these circumstances all of the normal projection equipment and television viewing are completely satisfactory.

Electric Lighting Systems. All of the seven principles of good lighting should be considered in the design of electric lighting systems. The numerous types of lighting fixtures and systems now available include many that

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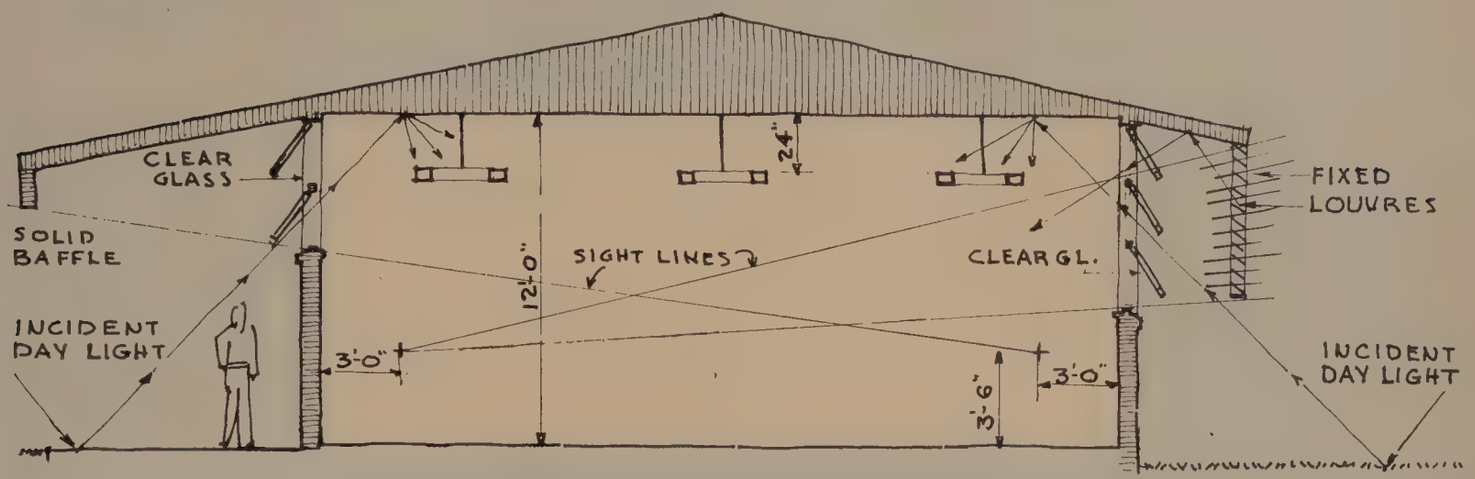
HENRY L. WRIGHT (near r.) . . . architect, Kistner, Wright & Wright, Los Angeles, since 1941 . . . first vice president, American Institute of Architects . . . a representative of A.I.A. to the Joint Task Committee on School Lighting . . . trustee, Illuminating Engineers Research Institute from 1959 . . . 1953 president, California chapter, American Institute of Architects . . . FOSTER K. SAMPSON . . . chief electrical engineer, Kistner, Wright & Wright, Los Angeles . . . special consultant to the Joint Task Force Committee on School Lighting . . . member, board of directors, Consulting Engineering Association of California from 1954.

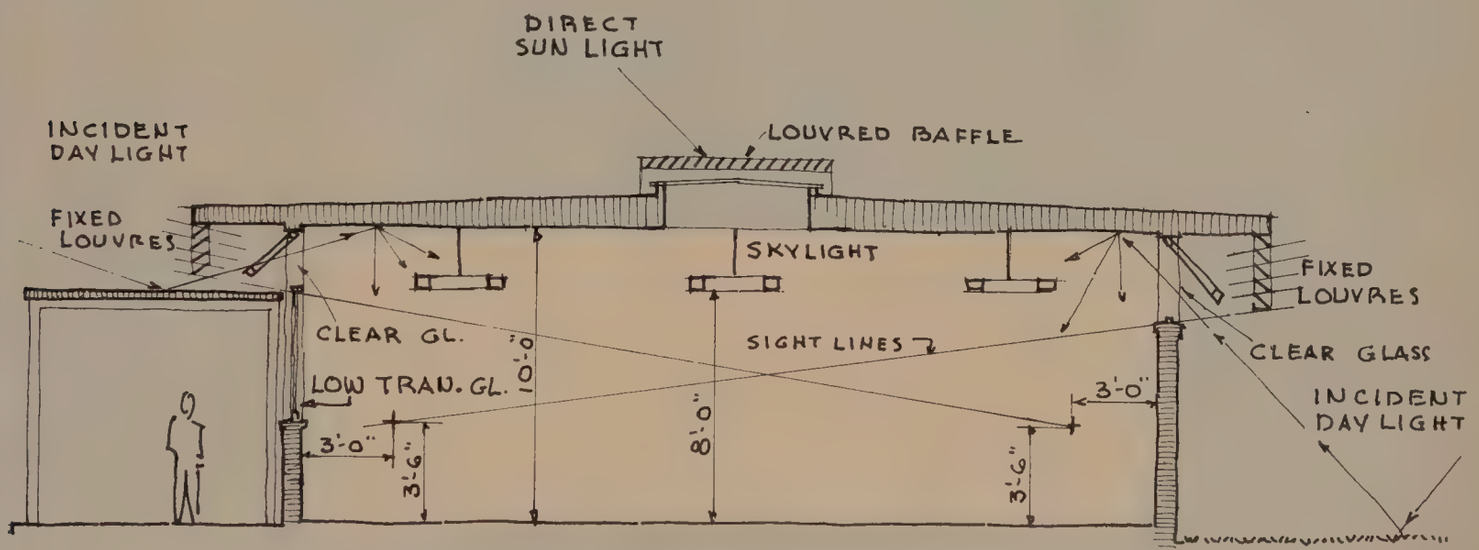
Wright

Sampson

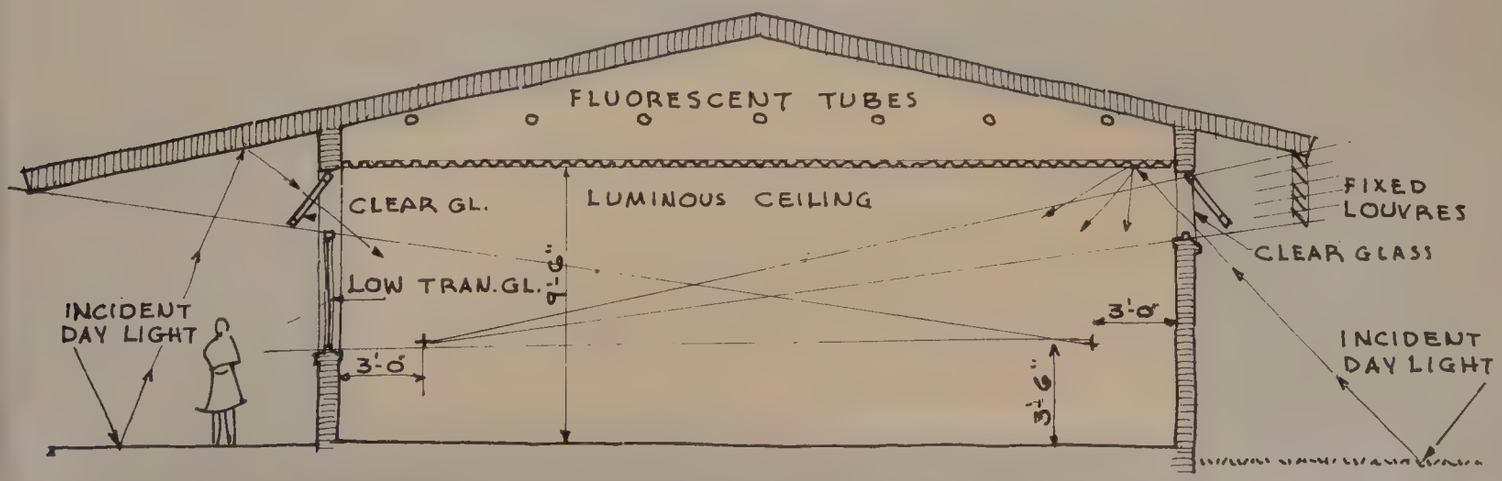
DAYLIGHTED ROOM employing fixed exterior louvers, roof overhang, and all clear glass should produce 35 to 60 foot-candles of general daylight illumination.



LOW CEILING daylighted room uses skylight to augment light from side windows. Low transmission glass is used in vision strip. The room has an indirect electric lighting system.



COMBINATION of daylight and electric light is shown in this room. Luminous ceiling augments small glass areas for daylight. Low transmission glass is used in vision strip. All clear glass is shielded from sky glare.



are not acceptable for classroom lighting even though they may be satisfactory for many other applications. Generally, any system that provides large areas of relatively low surface brightness will adequately serve the purpose – incandescent or fluorescent.

Incandescent Systems. The most successful incandescent systems are those that employ indirect fixtures. In these cases, care must be used to suspend the fixtures far enough from the ceiling to avoid spots of high brightness on the ceiling and to distribute the light with reasonable uniformity on the ceilings. Where this is done the uniformity of lighting throughout the classroom is assured.

Fluorescent Lighting System. Where fluorescent lamps are used, the same basic rules apply. There should be no areas of high brightness that exceed approximately 300 foot-lamberts. This may be accomplished by large areas of low brightness. Fluorescent fixtures provide good quality and adequate levels of illumination if they are suspended from the ceilings, arranged in continuous rows, and the rows spaced to distribute relatively uniform light on the ceiling. Indirect illumination is provided with almost the same efficiency as direct diffused lighting because of the high reflectances recommended to balance the entire environment. Surface mounted fixtures with diffusing devices may be used if the direct glare is controlled and adequate light is directed to the ceiling to reduce extreme brightness differences between the luminaire and the ceiling. This scheme, when carried to its ultimate development, becomes a luminous ceiling.

Any electric system that provides large areas of relatively low surface brightness will usually suffice in the classroom —incandescent or fluorescent

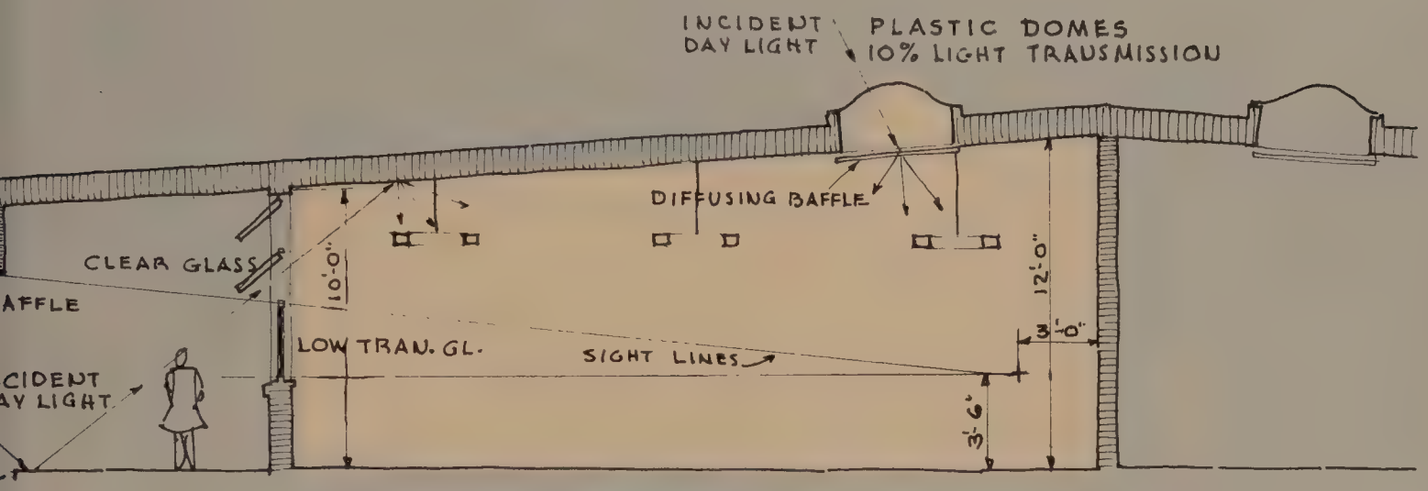
The wide variety of lamp lengths, light output, and colors available in fluorescent lamps provides a challenge to the electrical engineer that should not go unanswered. One who understands the several basic requirements and is willing to search out the different possibilities will surely evolve several interesting and economical systems that will satisfy all lighting requirements and still not detract from an otherwise esthetically pleasing environment.

Not any one of these solutions is universally applicable to all school buildings. Local weather conditions and the physical characteristics of the particular school site must be considered. Decisions must be made with regard to what is more desirable for the total requirements of the plant. In some areas sunlight is cherished during the winter months; whereas, in other areas it must be carefully shielded to reduce the heat load and glare.

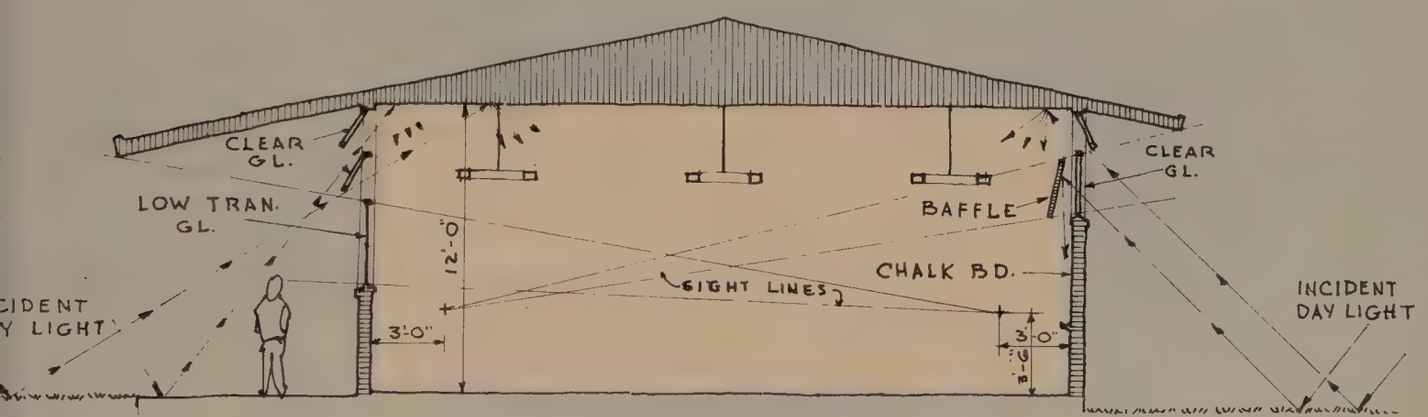
Contrary to common belief, a low overcast sky is one of the critical conditions that must be considered because of glare. Glare from outside surfaces that reflect light into the classroom can be a serious problem if not guarded against in the final design. For example, snow, paved areas including both concrete and asphalt, and grass produce glare when viewed from the inside of a building.

Generally, experience and research reveal that glare from any source is detrimental to the visual task. Glare is produced by great contrasts between light and dark. Glare can be corrected by balancing the light from every source – windows, walls, floors, ceilings, lighting fixtures, and so forth – within the recommended ratios. A favorable and desirable visual environment will result. ■

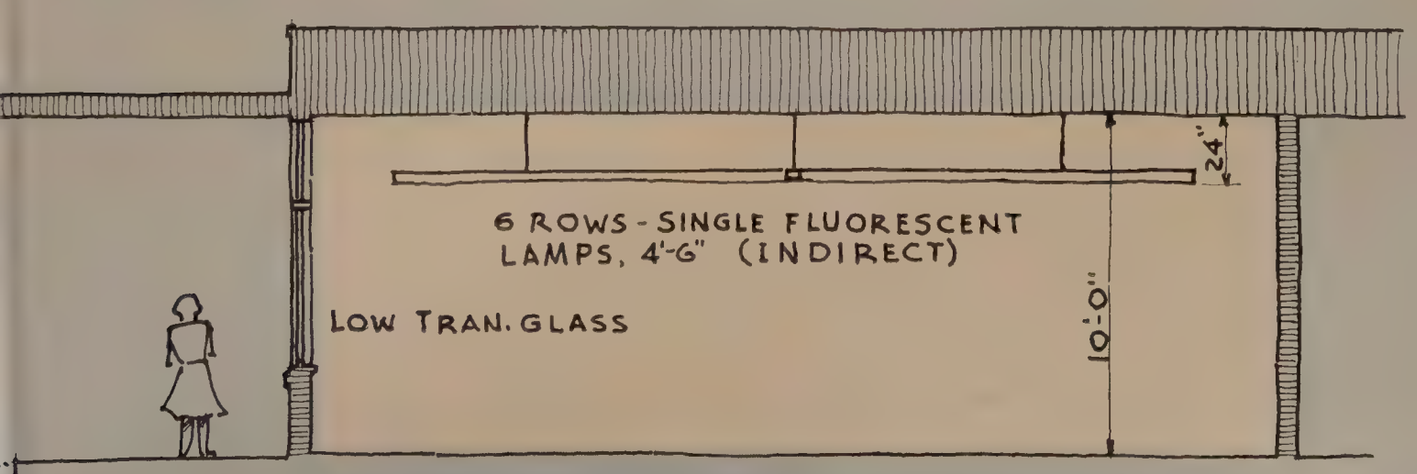
BACK-TO-BACK classrooms have top daylighting to augment daylight from side windows. Low transmission glass is used in vision strips.
When required, indirect fluorescent lighting supplements daylight.



DAYLIGHTED classroom shown here has no exterior shielding devices. Roof overhangs shield clear glass on high windows. Low transmission glass for sky glare control is used in vision strip.
Interior baffle shields clear glass of clerestory window and reflects light downward to chalkboard.



CLASSROOM with low ceiling is lighted electrically. Low transmission glass is used in vision strip.



RENOVATION

In most old schools nothing but a full face lifting will achieve correct lighting. Here are ways to go about it efficiently and economically

LLOYD L. WAITE

MANY school plants constructed prior to 1900 and for the first three decades after the turn of the century reflect small attention to the visual environment in terms of today's goals.[1]

The decision to attempt remedial work in these older buildings rests with the local community and its elected school board. The superintendent, as the chief administrator, has the responsibility of acquainting the school board and the community with the problems of renovation. Anything less than a full "face lifting" will fail to accomplish the desired goals.

To remodel an existing structure for the purpose of creating a more effective learning environment:

1. Employ the services of a competent architect and engineer. Determining the structural soundness of the building is mandatory to further evaluation.

2. Assuming the building is sound or can be made so within reasonable cost, make sure that the renovated plant can meet educational needs.

3. If these two prerequisites are met, attention can then be directed to specific aspects of the renovation program, and for purposes of this discussion, to the problems relative to visual conditions.

The two sources of light are sunlight and artificial light. This elementary observation may seem obvious, but often the two have been treated as unrelated and as quite separate factors. These two light sources should be treated as part of a whole and regarded as aspects of a common problem.

Sunlight. Sunlight is a constantly changing variable. Therefore, the results produced are changing constantly; in a single six-hour day a schoolroom may experience light ranging from bright sunshine to completely overcast conditions. Also, it is not unusual for serious glare problems to result from adjacent buildings or from the grounds around the building. Many of the older buildings were constructed on a site with no regard for the direction of the sun; or, they were built in an H-pattern or in hollow squares with some classrooms facing an enclosed court while others faced all the four major points of the compass. To make the problem even more complicated, some corner rooms have east-south window areas while others have north-west exposures or some other two-direction combination.

Under these conditions the use of sunlight needs to be controlled if a balanced visual environment is to be achieved. A wide variety of devices, ranging from L-shaped outriggers to double roller pull shades, may be employed. In some cases the most economical solution is to reduce drastically the window openings and glaze the new sash with a low light transmission glass.

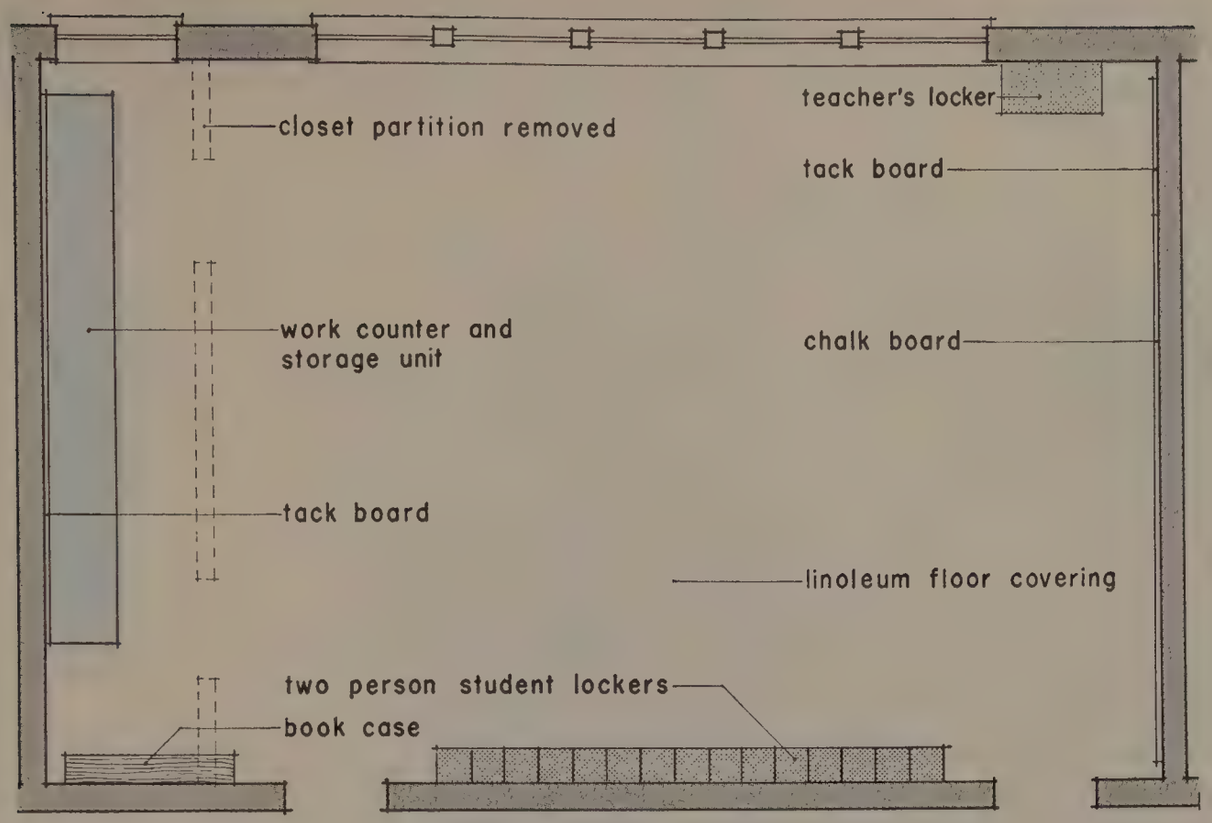
The device or devices employed should: (1) produce the desired control, (2) require a minimum of personal attention for operation, (3) be realistically economical in first cost and future maintenance and/or replacement. Careful architectural and engineering studies are requisite to the final selection and installation of any control device because each building presents unique problems.

While direct sunlight and reflected light may be controlled by using the foregoing technics, ground glare presents another problem. Many of the older school sites are small, and although an attempt has been made to grow grass around the buildings, the results are poor. The packed earth that is left adjacent to the school provides a surface with a fairly high reflection factor. In northern areas there is also the problem of snow glare during the winter months.

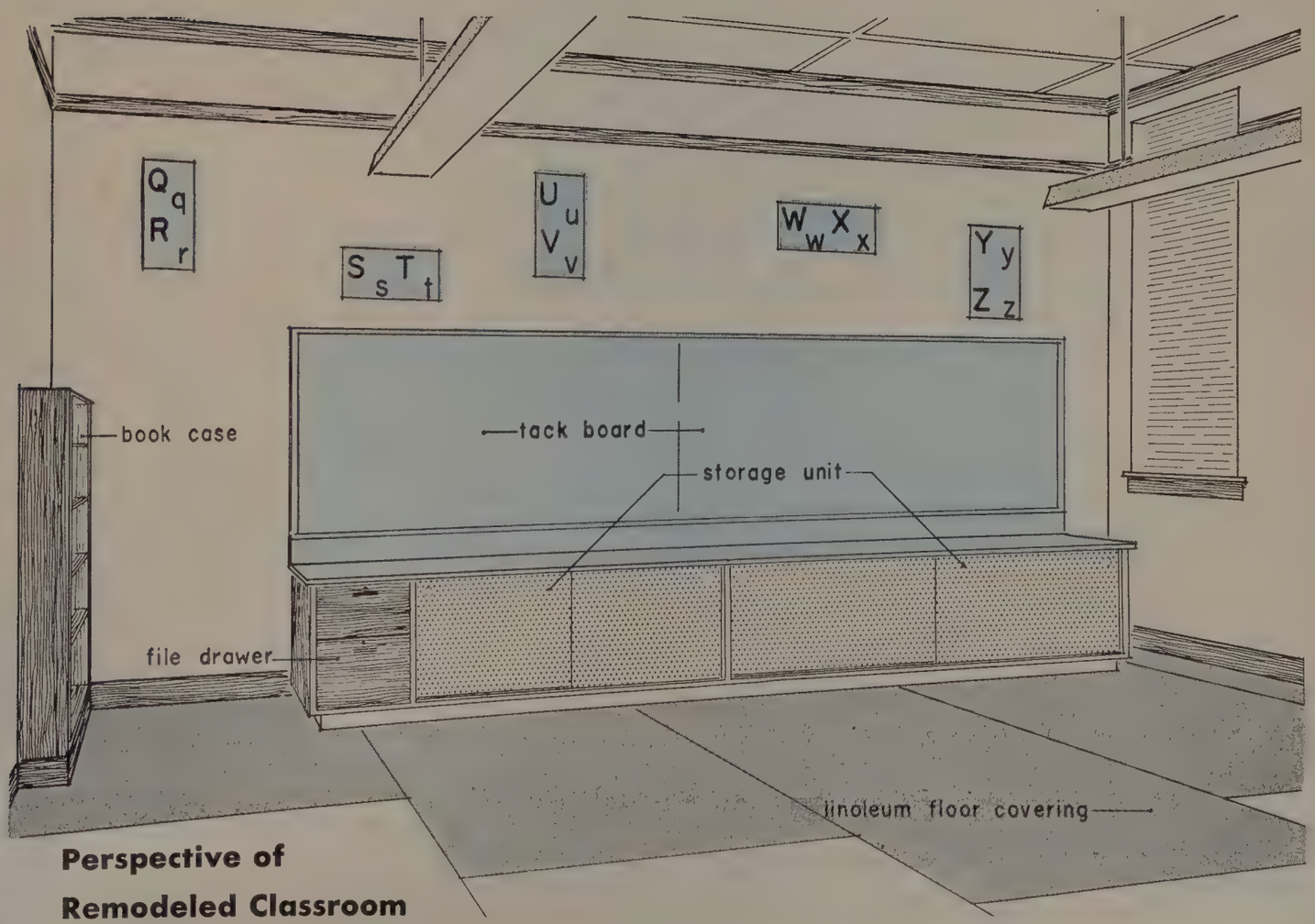
One solution is the actual paving of a school yard, using a colored topping having a low reflectance factor. This solves the problem in snow free areas, but it is only a partial solution where snow remains for several months. Reflected ground and snow glare can be controlled by fenestration devices, provided attention to this detail is given at the time the fenestration areas are under study. The danger lies in failing to recognize this aspect of the problem, with the result that no provisions are made for controls.

Fenestration. Early attempts to set standards for fenes-

[1]Guide for Planning School Plants. National Council on Schoolhouse Construction, 1958. Pp. 213-227.



Floor Plan of Remodeled Classroom



Perspective of Remodeled Classroom

tration in school plants are reported by Hamon[2] from a 1914 U.S. Bureau of Education Bulletin in which the "1:5 ratio of glass-to-floor area and windows 4 feet from floor, 6 inches from the ceiling and set well back from the front wall" was recommended.

Strange as it may now seem, these dimensions dominated school construction for the first 35 years of this century and set the window pattern for the typical classroom (22 by 30 by 12 feet). In addition to becoming "standards" for that time, they also were adopted by many local and state authorities as part of the school building codes that remain in existence today. To modify the existing fenestration pattern may require a change in existing codes. This is a worth-while venture and is recommended in those localities where codes need to be updated to permit effective light control by fenestration modification.

Wiring. The wiring in many of the earlier school plants was done with No. 12 or No. 14 wire. Quite often it was run without conduits in attics and walls. Careful inspection of existing wiring is requisite to any modification in the lighting system. This is particularly true since today's educational program utilizes a wide variety of electrical and electronic devices in addition to the increased load of the modified light source.

The services of a competent engineer are necessary. His inspection should cover the main service line or feeder system, pot heads, internal distribution system, and control units. Data resulting from this type of study will indicate the nature and extent of work required to produce a system of wiring that is safe and will provide the necessary power supply for the instructional program.

Fixtures. The selection of luminaires for classroom use poses many problems. The mere quantity of light is not the answer. Due regard must be paid to brightness balance and, especially, the accepted 1:10 ratio factor.

Several questions must be answered if anything more than hit-or-miss results are to be obtained:

1. What is the nature of the visual task to be performed in the area, *i.e.* typical classroom, drafting room, shop, sewing room, library?
2. Will the area be used only during daylight hours or will it also be used at night?
3. How much daylight can be utilized effectively?
4. What are the dimensions of the room, including ceiling height?

Of course, recommended levels of illumination for various visual tasks should be a part of the criteria in fixture selection. They are discussed elsewhere in this study.

[2]Lighting Schoolhouses. U.S. Office of Education, Washington, D.C. Pamphlet No. 104.

LLOYD L. WAITE . . . building coordinator, Shreveport (La.) public schools since 1952 . . . instructor, Centenary College, Shreveport from 1947 . . . instructor in education and industrial arts high schools, colleges, universities in Ohio, Georgia, California, Michigan from 1935 . . . President, National Council on Schoolhouse Construction.

In addition, there are the problems of initial cost and power consumption. Generally, incandescent fixtures are lower in initial cost, but higher in operating cost; the converse is true of fluorescent fixtures. Whatever fixture is selected, it should produce the required quantity of light and meet the accepted brightness goals. This approach will rule out bare light bulbs and unshielded or poorly shielded fluorescent tubes.

Under ideal conditions the light fixture would not be noticeable because its brightness would blend with the surrounding surfaces. This suggests that a semi-indirect fixture be used that is properly shielded and so spaced in the area that a uniform light pattern, having both requisites of quantity and quality, is developed. This is no job for the amateur; it requires the services of a competent illuminating engineer who is willing to work toward acceptable goals within the framework of the visual task approach.

Floors. For more than a half century it has been standard practice to maintain wood floors by treating them with floor oil in liberal application. The result is a dark, low reflectance area which, because of its location and size, falls within the visual range and produces a problem in brightness balance that must be overcome.

The only treatment that I know of for dark oil soaked floors is to cover them with an acceptable composition floor covering. The material selected should have a 30 to 40 per cent reflectance range and be free from distinct, contrasting color patterns.

To achieve brightness balance, color and light must be considered as aspects of the same problem. Often visual conditions can be improved as much by painting as they can by adding wattage. Light is absorbed by the dark colors of floors, walls, chalkboards and other furniture. To remove these absorbing surfaces requires a coordinated plan for interior decoration that will augment both artificial and natural light sources and yet fall within the overall brightness balance desired for the visual task.

An example of how one school system approached this problem is to be found in "Color Planning for School Interiors," prepared by the division of business affairs, St. Paul public schools. Here is a valid attempt to make color work both physiologically and psychologically.

The following reflectance factors are generally considered appropriate in instructional areas: ceilings, 85 per cent; walls, 60 per cent; floors, 30 to 40 per cent.

In addition to the reflectance factor, color has other values. The institutional sameness of a building may be modified into spaces that have interest and individuality through the judicious use of color and color combinations. "Cool" colors, such as blue and green, can reduce the impact of too much sun; conversely, "warm" colors, such as yellow and orange, can be used in areas that receive little or no direct sun. Also such areas as corridors, stairwells, auditoriums and stage areas, offices, toilet areas, laboratories, multipurpose rooms, and cafeterias can be removed from drab "sameness" and placed in a much more interesting realm through the use of color.

This approach to interior decoration does not affect the cost factor in actual materials, but it does cost time to plan carefully a coordinated color schedule for a build-

(*Continued on Page* 96)

The TEACHER

Too often teachers are unaware of what constitutes good classroom lighting. Needed: better professional preparation and inservice training

CLEVE O. WESTBY

DURING the last 30 years more attention has been given to the improvement of the visual environment of the classroom than in all previous history. Great strides have been made not only in determining what constitutes a desirable lighting situation, but also in devising the means to achieve it.

When one recalls all that has been accomplished toward good lighting and the understanding of its importance, it seems paradoxical that teachers, administrators and others responsible for conditions in the classroom often appear unaware of what constitutes a desirable visual environment. Their failure to make optimum use of lighting controls or other means to provide for the visual comfort and efficiency of the children would seem to substantiate this observation.

Teachers found indifferent to lighting conditions. Those of us who every year visit many classrooms in different states are repeatedly struck by the indifference on the part of teachers to the lighting situation in the classroom and what may even be regarded as mismanagement of the means available for controlling and utilizing light to best advantage. In fact, it frequently happens that in attempting to eliminate or relieve one uncomfortable light condition, another is produced that may be as bad or worse. Of secondary, but surely not insignificant, importance is the needless expense for artificial light on days when a reasonably satisfactory condition can be obtained in many classrooms by the use of available and properly controlled daylight. Yet it is not unusual to find teachers pulling the shades all the way down and turning on the lights although it may be a beautiful day outdoors.

Teachers must understand factors to evaluate lighting. Judgments are based on relative values and on an understanding of proven standards of performance. If a teacher has been accustomed to working in a classroom with 15 foot-candles of light and suddenly has new fixtures installed giving, for example, 35 foot-candles, he is going to be greatly impressed with the increased illumination. But if he does not have an appreciation of the importance of brightness balance within the room and the undesirability of factors responsible for glare and high brightness ratios, he cannot judge whether a desirable visual environment has been achieved through the new installation. (On several occasions I have found classrooms with newly installed fixtures that yielded a high foot-candle intensity but were of such poor design as to produce almost intolerable glare. Yet in virtually every instance the teacher expressed himself as being happy with the new fixtures.)

Those responsible for teacher education and those who determine the requirements for certification do not seem to regard classroom lighting as an area in which teachers should have a sound basic training. There has been a tendency to leave lighting to the "experts" – the architects and lighting engineers. The assumption is that there is little for the teacher or the administrator to be concerned about, other than doing what good judgment would seem to indicate as lighting conditions change during the day. Herein lies a fundamental error.

Only required courses can "enlighten" teachers! Lighting and its control is so highly technical that to exercise good judgment requires considerable knowledge of the many facets of this intricate science. This knowledge can only be acquired in a course that involves areas of study,

CLEVE O. WESTBY . . . director of school building services and coordinator of the state colleges construction program for New Jersey since 1953 . . . director of school building facilities, Washington State Department of Education from 1948 . . . teacher, high school principal, and superintendent, Montana schools for 23 years.

such as the physics of light; the physiology of the human eye and of how it responds to various light conditions and tasks; the causes of glare and how it can be eliminated; the measurement of light intensity and brightness; the light requirements for various tasks, and the accepted standards for a desirable visual environment.

The teacher should be expert enough to determine whether the lighting conditions in the classroom are reasonably satisfactory in terms of accepted standards. He should be able to use effectively available controls, such as shades, Venetian blinds, draperies, louvers or other devices. Most important, he should be so conscious of the importance of a good visual environment that he will not ignore poor lighting situations whenever and wherever they happen to be in the classroom.

Administrative lap is place to throw classroom lighting problems. Admittedly, the teacher cannot always rectify a visually undesirable condition. However, if he finds a condition he cannot correct because available controls are inadequate or the lighting fixtures are illy adapted to their purpose, he can bring the condition to the attention of the principal and/or superintendent. In most cases he will get some action.

It may be argued that a teacher's evaluation of the quality of the visual environment in the classroom may not be taken very seriously by his supervisors. This may be true under present conditions where so many teachers have been provided so little information in the field of school lighting. However, if teachers are given the information and understanding they should have in this important aspect of the teaching process, they will command as great a respect for their opinions of the lighting conditions in their classrooms as they do for their judgments on teaching materials or subject matter.

The solution lies partially with those responsible for the requirements of teacher certification. Those who are responsible for the preparation of teachers and administrators should make certain that this important area is not neglected and that adequate courses are not only offered but required.

Inclusion of material regarding good visual conditions in the teacher training curriculum is not enough. Preservice education in this field, good as it may be, will not guarantee a completely informed person any more than other preservice education guarantees a completely competent and skillful teacher. There must be continued *in-service* education if the objectives are to be obtained. This on-the-job education can then apply to situations and problems faced by teachers in the everyday management of their classrooms, rather than the somewhat hypothetical situations that might be studied in preservice instruction.

Inservice education can be concerned with improvements in contrasts within the tasks, seating, control of high brightness from the outdoors at different times of the year and under different conditions, the avoidance of specular reflection from shiny surfaces, the use and care of the chalkboard and so forth.

Teachers must understand the fundamentals of a good visual environment and the principles upon which they are based, and they must apply that knowledge lest the best efforts at good design be negated by unwitting mismanagement of the environment. ■

METHODS of studying glare as used in research conducted by John M. Chorlton. (Story on Page 84 provides details.) Here glare is minimized because movable shield is lowered to horizontal position to intercept light falling on the task in the direction of the glare. Were shield to be in vertical position while task was being observed, glare would be present. A special control panel (far left) adjusts illumination level when conditions change from glare to no glare.

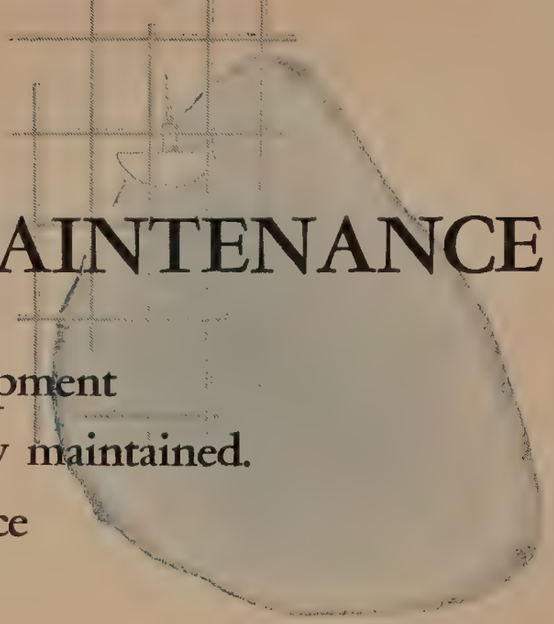
RENOVATION

(*Continued From Page* 94)

ing. However, this cost is small compared to the cost of indifference which is heavy in relation to the effect of the visual environment on children and youth.

Furniture. Most equipment manufacturers are now producing classroom equipment in acceptable finishes with a matted surface and a reflection factor of 30 to 50 per cent. When buying new furniture or refinishing it, these percentages should be considered. The same is true of casework, lockers and other instructional apparatus including chalkboards and tackboards.

In older classrooms it is not unusual to find slate "blackboards" covering the major portion of two, and sometimes three, walls with cork tackboard mounted above the writing surface in a narrow strip. Contemporary instructional practice suggests that much of the writing surfaces can be removed and that the tackboard strip is not very satisfactory as a visual-aid device. The removal of these light absorbing surfaces will free the wall areas for more effective light treatment and, by providing a suitable chalkboard at the front of the room accompanied by a tackboard, will contribute to both the teaching and learning process. ■



MAINTENANCE

Half of the investment in design and equipment may be wasted if facilities are not properly maintained. Here is a guide for efficient care and service

RICHARD F. TONIGAN

INADEQUATE care of school lighting facilities can waste as much as 50 per cent of the electricity consumed and 50 per cent of the illumination produced. Good lighting presupposes good lighting maintenance.

Today's complexity of lighting equipment, accompanied by tremendous modernization and new building programs, has created problems of major proportion for the school business manager. He has had to assume broadened responsibility for the care, repair and ultimate replacement of a variety of illuminating systems.

Scope of Services. There are many types of light producing and light control devices related to daylight that require the scheduled, periodic attention of personnel responsible for school building services. These include: windows and skylights, Venetian blinds, louvers, shades, awnings, building projections, sun screens, draperies and "electric eyes."

Regular attention also must be given to devices related to using or controlling man-made light. These types of lighting fixtures include: incandescent, fluorescent, mercury vapor, and cold cathode; electrical distribution systems (wiring, panels), and reflective surfaces.

Although the foregoing lists are brief, they do begin to show the complexities that confront school operations and maintenance personnel. It must be remembered that in the case of each of these items, building service employes also must be concerned with the following questions:

Which materials were used in constructing the items? Are they metal, plastic, wood, fabric, glass, ceramic? What are the construction details – size, shape, movability, finishes? What are the mechanical characteristics of the motors, drive shafts, ballasts, electric controls, protectors? What aspects of the manufactured materials determine which one fits where? What combination gives longer life, greater efficiency, proper lighting level; desired color(s), proper shape(s), automatic sun control?

Cleaning Schedule. Three basic steps in the continuous, routine care of lighting facilities are: cleaning, replacing worn parts, and follow-up and inspection.

When designing a school lighting installation, the engineers calculate the planned illumination for each room in terms of the percentage ranges of light reflection. It is essential that property managers be familiar with these assumptions of the engineers and accept the responsibility for maintaining the reflective surfaces within the state of cleanliness assumed by the planners. The cleaning of walls, ceilings, lighting fixtures, lenses, tubes and lamps is important to the maintenance of adequate lighting, as well as to the creation of healthy plant conditions.

Dirty fixtures, lamps and tubes block the transmission of light so that from 25 to 50 per cent of the light produced is prevented from reaching the task level. Soiled walls and ceilings can reduce lighting levels by 10 to 20 per cent. Since the school pays for all of the light produced within the lamp or tube, every effort should be made to get as much of it as possible – within reasonable economics – to the working surface.

One of the least heralded advantages of quality lighting equipment is the factory applied finishes. These greatly facilitate cleaning, reduce soiling, improve appearance, minimize long-range painting problems, and help to guarantee a high degree of reflectivity when properly cleaned.

Cleaning Methods. There is no certain number of cleanings that must be scheduled within any limited period. Dirt and soil conditions, filter systems, building needs, and so forth determine how quickly lighting facilities become soiled during different periods of the year.

Fabric-type lighting controls generally are cleaned by washing or dry cleaning. It is frequently done by outside contractors.

Venetian blinds may be cleaned individually by hand, by belt-type dishwasher, or by a contract Venetian blind laundry.

Annual cleaning is the common practice, but most inspections show that blinds need semiannual servicing. Using a contract cleaner during the Christmas vacation and then building and grounds employes during the summer vacation offers the school administrator a good oppor-

tunity to compare costs, quality and convenience. It is better to repaint, replace cords and slats, and make other adjustments when the blinds are down for cleaning.

Lighting fixtures ordinarily are cleaned manually, but some portable cleaning solution tanks are utilized. Contract cleaning appears to be the most economical approach to cleaning fixtures in areas where low-wage labor is available and where the market is sufficient to foster competition.

Electronic cleaning offers possibilities; new cleaning equipment and technics are needed.

Replacement. Although the term "preventive maintenance" is common usage, the practice it denotes is not. Preventive maintenance measures will save money, avoid inconvenience, and leave both the administration and employes with ulcer-free anatomies.

Too much time and effort frequently are spent trying to patch, mend or "make do" an old part. The economical way generally is to replace worn fixture components and materials before they break, burn out, or fail.

The need for attention to a lighting facility is not always apparent before failure. Once a failure does occur, immediate repair service is requested and expected. As "rush" service is almost always more costly than routine, group scheduled work, it is vital that lighting emergencies be held to an absolute minimum — by preventive maintenance. Keep electric panels in good shape, properly fuse circuits, and check wire connections.

When washing light fixtures, also replace the lamps if it is near the scheduled time. Replace either all of the area, saving those tubes without blackened ends for future interim replacements, or replace only burned out and blackened tubes. Normally about 15 to 20 per cent of the tubes should be worn out, or in the last stages of life, when replacement occurs.

It is advisable to maintain controlled stocks of the different tubes, bulbs, starters, sockets, slats, cords and other items used frequently so that repair or replacement can be made with minimum delay.

Ballast Replacement. One problem facing school operations and maintenance employes is the replacement of fluorescent ballasts. Each fixture has at least one ballast, and most generally one for every two tubes. The intended life of 12 to 15 years for better ballasts can be safeguarded by good design and by the scheduled relamping and proper replacement of shorted starters. Their life can be shortened drastically if handled improperly.

The cost of replacing each ballast may approach 10 per cent of the initial cost of the lighting fixture. For this reason the work should be undertaken with great care. One cannot always assume that the original lighting installation was designed adequately. Thus if there are frequent ballast failures the plant supervisor must find out if this can be economically remedied, either by changes in the design or by a change in ballast specifications.

Persons responsible for lighting facilities must be acquainted with optimum operating temperature conditions; overheating of a ballast can cut its life in half.

Fusing ballasts will not only eliminate the inconvenience of losing entire strings of fixtures, but also will protect against fire hazards and ballast damage from excessive line voltage fluctuations.

As better lighting fixtures are designed for proper ballast heating and heat dissipation, plant supervisors must be sure not to cover recessed fixtures with insulation materials; such coverage will affect adversely the heat control of the lighting fixture and thereby wear out the ballast.

System Replacement. When confronted with the need to replace portions of the lighting system, building service managers should obtain qualified consulting assistance. Probably most of the fixture replacements that result in inadequate light production or control are the result of insufficient consultation with qualified architects and engineers.

Since the replacement of electrical distribution systems also involves protection from fire, all new wiring should be used as the lighting system is modernized in each individual plant area.

Maintenance Records. Much can be done to minimize future maintenance problems if maintenance supervisors can be encouraged to build up a file of drawings (architectural, engineering, shop and manufacturers' drawings) on all new school installations. Ordinarily it is easy to assemble such drawings, specifications, manufacturers' materials and sheets during and immediately after construction, but years later this is difficult. Many hours of labor and checking are eliminated when the needed blueprint is readily available.

To get the best service from the lighting system, its designers should be invited to meet with school operations people, both prior to and just after occupancy, to explain both design and operations.

Records. Cost records, too, should be maintained. More and more, it is essential that the school district have complete information on the operation and maintenance of its lighting facilities. The annual cost of this work is increasing substantially as the result of higher lighting levels, more fixtures, and a greater variety of design. Only by knowing the cost of replacing electrical equipment and of the cleaning program is it possible to make comparisons with the projected cost of a proposed change in procedures, or with the contractor's quotation.

Follow-Up. Periodic inspection of maintenance and operating procedures is the best way to assure desired illumination, good labor supervision, and a sound economic basis. Areas must be visited periodically, and cleaning and replacement needs must be noted, scheduled and executed. ■

RICHARD F. TONIGAN . . . plant manager, Teachers College, Columbia University since 1957 . . . assistant to the assistant superintendent in charge of business, Arlington County (Va.) public schools from 1952 . . . training specialist, U.S. Department of the Navy from 1951 . . . research assistant, University of Illinois from 1949.

ADMINISTRATION

Research, principles, know-how: These are without value unless the administrator applies them to schools. Here is a step-by-step way of doing it

CHARLES D. GIBSON

ALL the research, principles, policies and general know-how that can be accumulated will not result in good visual environments in our nation's schools until and unless school administrators see to it that such findings are *applied* to school buildings, old and new.

This is the administrator's job. No other person has the direct responsibility for seeing that it is done.

How can the administrator successfully go about this job? Here are some suggestions:

Good planning takes time! Nearly everyone knows that school officials have a full work load just running the operation of a school district. How can they add another time consuming responsibility to the full-time job they already have?

Some administrators solve this problem by delegating enough of their regular duties to others on their staff, thus gaining the needed time to participate in and lead planning conferences. Others delegate the planning responsibility to an assistant and do not become involved personally in this activity. Still others take on the added responsibility and squeeze the needed time out of their evenings, week ends, and so forth.

No matter how it is managed, *time* must be found and assigned to the planning responsibility if satisfactory results are to be achieved.

After both the right staff member and adequate time have been assigned to the planning duties, it is necessary that the administrator sincerely adopt the attitude that the school plant itself largely controls the success of the total educational venture. He must see in the school building and in the proper refinement of its spaces a real opportunity to make a large contribution to the success of the teaching-learning processes.

Insist on objective criteria. This attitude, as applied to the visual environment as one planning factor, will cause the administrator to insist that first there be set up comprehensive and objective criteria against which the visual environment will be planned. Second, he will insist that these criteria be screened to be sure they represent the best available thinking on the subject.

The administrator first must recognize the visual environment as worthy of detailed attention during the planning of school buildings. Second, he should ask himself these questions: Does the proposed solution meet the criteria of adequacy set up by the authors in this study in THE NATION'S SCHOOLS? If not, where does the solution fall short? What would be required to revise the solution so it would meet these desirable criteria?

After design criteria are established, the administrator must set up a problem definition and a problem solving process that will work toward the best possible solution for his particular situation. It is possible that professional-technical resources (such as architects and engineers) may resist the problem definition and problem solving process. In some cases, these "pros" know the answer before they know the problem.

Visual principles are new. The administrator must realize that the principles and policies governing a good visual environment in schools, as presented in this study, are relatively new ideas. Many architects and engineers never have heard of them. Some who have heard of them prefer to continue designing visual environments from the inadequate and incomplete data found in handy charts and tables that tell them at a glance how many foot-candles are recommended for the various teaching stations in schools.

The administrator must insist on a realistic definition of the over-all problem, since he must guard against being touted into overdoing one aspect of school building design at the expense of an over-all balance in design.

There are at least five educationally important school building design factors: spatial, thermal, visual, sonic and esthetic. All are highly important to the successful operation of the total educative process. Each one must be designed separately but at the same time *in relation to* the other four. The administrator must be sure that each and all of these design factors are considered carefully in terms of the best solutions possible within the scope or limitations of his own district's requirements and budgetary resources. (*Continued on Next Page*)

It hardly would be wise to preside over the planning of a classroom that met every recommendation for a good visual environment, if to do so meant an undersized space that was poorly ventilated, had no sound control, and had no esthetic graces except those of a shoe box. In order to avoid such a disaster, the administrator should be able to distinguish between professional competence and salesmanship. He must be able to recognize a "bedside manner" when he sees one.

Since it hardly would be fair to expect the administrator to meet all these challenges singlehanded, his best chance for success in this field is to pick a really competent architect and hold him responsible for the best results possible. The architect must share the same attitude about the educational significance of the school plant as that held by the administrator. He, too, must be willing and able to spend the time and to employ the engineering competence necessary to do a job well.

Architect can't do it alone! Some administrators make the fatal mistake of employing an architect and turning over to him the entire problem of providing a well balanced school plant. As competent as the architect may be, he alone cannot do the job well. The administrator must remain an active, interested, knowledgeable participant in the planning and decision processes.

Before beginning any planning assignment, the administrator should take a solemn oath that he never has been and never will become a member of one of the most insidious "front" organizations of our time — the American Institute of AMATEUR Architects (A.I.A.A.). William Caudill, one of the most persistent school planning "investigators" in the United States, first exposed this group of pseudo experts. The investigation was begun after John Lyon Reid had complained bitterly about "being experted to death by amateurs." Mr. Caudill's investigation put the finger on all administrators who come to planning conferences without one statement on educational specifications, but with a handful of crude graph paper layouts of the facilities being planned.

The educator-architect team, each working and contributing within his own area of competence, is a necessary prerequisite to a successful planning venture. The administrator's part is to contribute educational specifications and to insist that the educationally important aspects of design have the first call on budgets that seem always to be limited.

When planning the visual environment for a school, the administrator should provide the architect and engineers with specific information on the materials and methodology of the teaching-learning processes that will be used now and possibly in the future. The educational specifications should provide information on the following: types of tasks to be performed, teaching materials to be used, use of space, indoor-outdoor relationships to be established and maintained, working arrangements of the space, location of teaching machines, use of wall surfaces, possible rearrangement of space to accommodate anticipated methodology and student grouping changes, and so forth.

Ignoring daylighting can be fatal error. The administrator also must insist that *all* light sources meet the same criteria of quality. Often architects and engineers go to great and expensive lengths to design an electric lighting system that meets acceptable objectives, while they ignore completely the daylighting aspects of the design. It is necessary and possible, within average budgetary limitations, to provide both electric and daylight sources that meet the principles stated in this study. Often, in fact, it is possible to provide a good visual environment for less money than a poor one would cost.

The administrator, too, is responsible for setting the priorities on the various design features that come under consideration in the school planning. It is his job to state which design features are provided for first from the limited building budget. If the architect has been given a $15 per square foot cost limit, it is the administrator who must be satisfied that the architect is providing adequately for the spatial, thermal, visual, sonic and esthetic elements of the building before he decides definitely how he will solve other design problems, such as the structural system, the type of roofing, the extent of tile work, the seating capacity of the auditorium, and so forth. If providing educational features that meet recommended objectives costs $7 per square foot, the architect then knows he has $8 left to enclose and structure the space.

Architects usually do not work from such priorities. Customarily, the details of the visual environment are determined as one of the very last design decisions. Unless the structural, mechanical and electrical engineers are an influential part of the *team* that determines the overall design approach of the building, the administrator is almost guaranteed poor educational space before one shovelful of earth is turned.

Make safeguards part of contract. How can the administrator prevent such disaster? It isn't easy under the best of conditions, but he must try.

One effective way is to set forth some safeguards within the contractual agreement made with the architect. The first safeguard should guarantee the architect enough *time* for adequate planning. If a complete school plant is to be designed, the architect should be given a minimum of six months to do the planning for an elementary school and one year for a high school or community college.

The contract should state clearly that planning decisions will be documented in writing and the document signed by both parties to the contract before the architect is authorized to develop final plans and specifications.

The architect should be paid at least one-third of his total fee when the school district officials approve his completely developed *preliminary* plans and specifications. This is a larger fraction than is customary, but is recommended to emphasize the tremendous importance of careful and thorough preliminary planning.

The architect and his structural, mechanical and electrical engineers should agree to inspect the building and fulfill their particular responsibilities to it as it progresses under construction. When the project is complete, each professional should sign an affidavit that the building had been constructed according to the final plans and specifications approved by school district officials.

Instruct the building's users. After the project has been completed, the architect and his staff of engineers and

the administrator should conduct full-scale interpretation sessions for those who will use the building as well as for those who will operate, maintain, administer and pay for it.

A further contractual clause should call for a review evaluation of the building or facility after it has been in use a full school year. In terms of the visual environment, such evaluation should include a detailed check by qualified persons using appropriate modern instrumentation to determine how well the designed visual environment meets in operation the principles against which it was designed.

An inservice educational program is highly important to create a staff and student body that is properly informed about the whys and wherefores and values of a good visual environment. For example, it is useless to spend time and money constructing a good visual environment and then have an uninformed, budget-happy purchasing agent buy the wrong lamps for the electric light fixtures ("The salesman said they were just as good and 2 cents cheaper"); or take the diffusers off the light fixtures and expose bare lamps ("to get more light"); or repaint in dark wall colors ("to save on maintenance costs"); or cut down the window and fixture cleaning schedule ("to save the man-hours needed to refinish the floor in the board room"); or buy No. 3 rather than No. 1 or 2 grade pencils ("I could get No. 3's in a carload lot").

It is the administrator's duty to acquaint teachers and students with the values of good visual environment, and to hold 'interpretation sessions' for those who maintain the lighting system

Let teachers and students understand visual environment. Teachers and students should be encouraged through inservice programs to understand how the environment affects their school work. They should be given the scientific reasons why high contrast within the visual task is good and how it relates to the selection of printed materials, type and quality of paper and inks, writing on the chalkboard, and the preparation of duplicated materials. Teachers and students need to know about such physiologically interesting and pertinent facts as the function of the "accommodation processes" of the eye — that it takes time for eyes to adapt to the best illuminated interior when they are brought into a classroom after being in the bright out-of-doors, and so forth.

Maintenance men should be consulted not only during the planning processes, but also must be given inservice education after a building or installation is completed. They must be informed about the function of reflection factors of paints as they relate to the balance of a visual environment. They must know why it is important to maintain surface reflectance values as near as possible to the original finish. They must have the facts on the importance of regular cleaning schedules so that high utilization can be maintained from electric and daylight sources. They should understand the loss of lumen output efficiency from old lamps and the values to be gained from recommended practices, such as group lamp replacement. The maintenance men should know why they should correct the administrator who wishes to use the wrong lamps, paints or finishes (and how to keep in touch with new job opportunities if they do correct him).

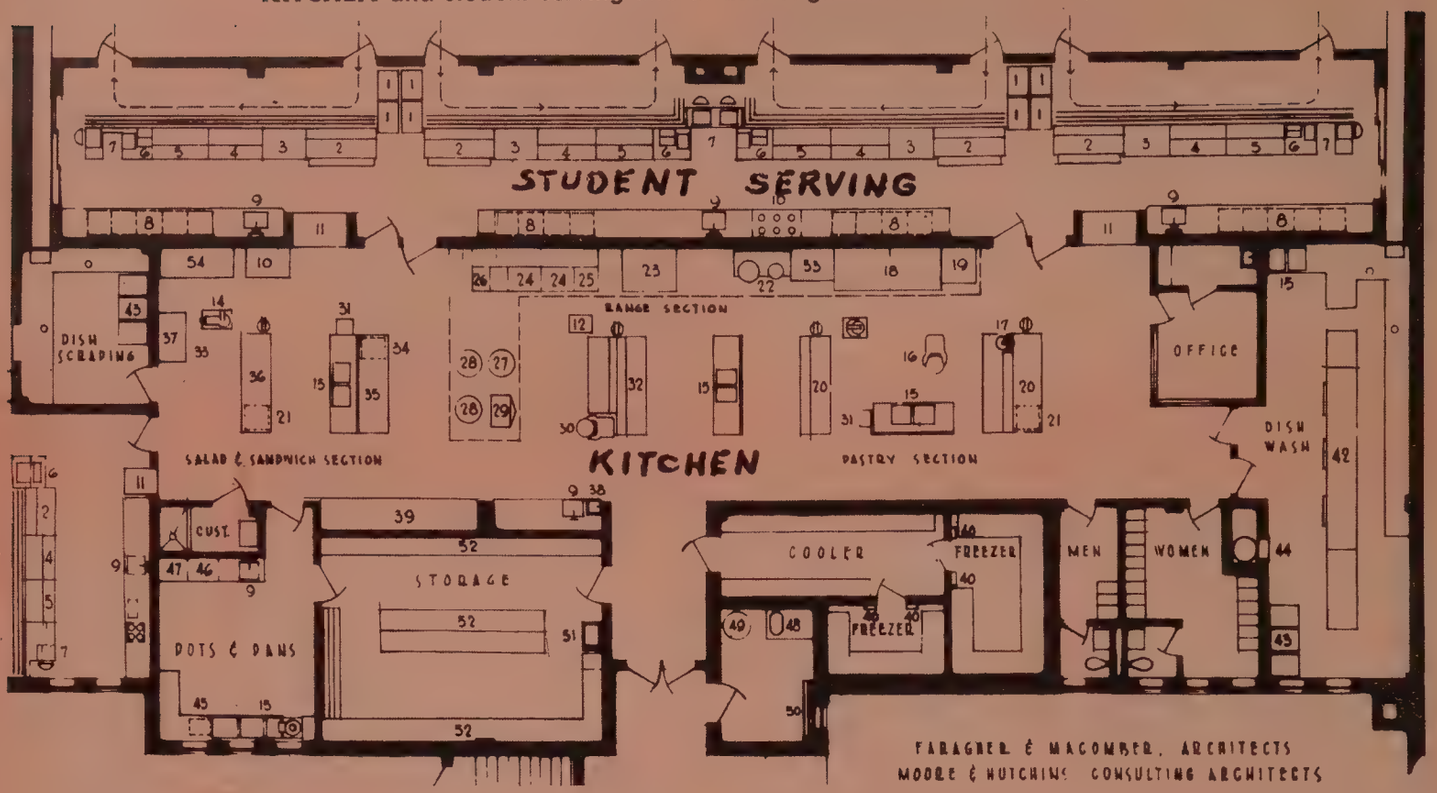
Keeping board in dark spells trouble. In some states there is approximately a 40 per cent turnover in school board membership each year. Often the membership of the school board introduced at the dedication ceremonies for the new school building is different from the one that signed the final plans for the projects. School board members must be kept informed about the whys and wherefores of school building design if administrators hope to maintain a climate of understanding and confidence with their governing boards. An inservice educational program for board members is one good way to establish and maintain such a desirable climate.

Inservice programs are for administrators too. After going through one successful planning experience, the wise administrator doesn't develop an "I know the answers now" attitude. He realizes that for the last 200 years, according to Robert Oppenheimer, man has doubled his scientific knowledge *every* 10 *years*. This same doubling rate is projected as far ahead as we can see into the future.

The smart administrator doesn't try to become an expert in the various highly complex areas of school planning. He begins each new project with an attitude of concern and the problem solving approach. He seeks competent resources that know and stay abreast of new developments. He organizes available competence and leads with the philosophy that planning is basically a process of compromise. He realizes there is no one solution to any planning problem. He accepts his job as one of cooperatively finding the best solution to his specific problem as related to an ever changing set of factors and circumstances. ■

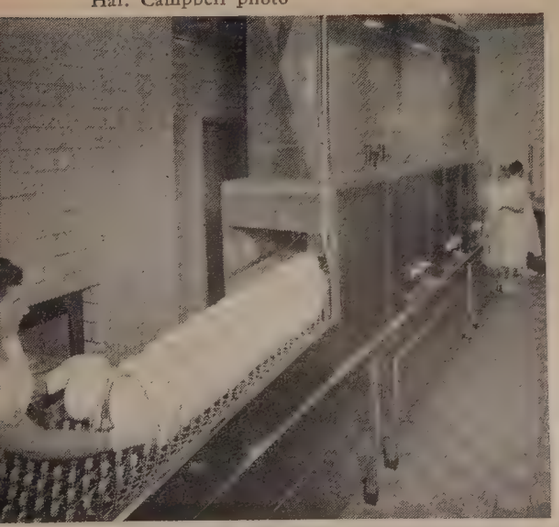
CHARLES D. GIBSON . . . chief, bureau of school planning, California State Department of Education . . . previously teacher and administrator, California public schools . . . past president, National Council on Schoolhouse Construction . . . a representative of the council to the Joint Task Committee on School Lighting.

KITCHEN and student serving line at East High School in Rochester, N. Y.



1. TRAY TRUCKS
2. ELECTRIC HOT FOOD WELLS
3. MILK CONVEYERS
4. COLD TABLE
5. DESSERT TABLE
6. SILVER, STRAWS, NAPKINS
7. CASHIER AND CHECKERS
8. ROLL-AWAY DISH STORAGE TRUCKS UNDER
9. SINKS
10. ICE CREAM CABINET
11. PASS-THROUGH REFRIGERATOR STORAGE
12. PORTABLE SLICER
13. PORTABLE MIXER
14. VEGETABLE CUTTER
15. TWO-COMPARTMENT SINKS
16. 30-60 QT. MIXER
17. 20 QT. MIXER
18. SIX INDIVIDUALLY CONTROLLED BAKING DECKS
19. FOUR-BURNER UNIT (FROSTINGS)
20. PASTRY TABLES
21. REFRIGERATED SECTION UNDER
22. TRUNION KETTLES
23. COOKS OVEN
24. RANGES
25. BROILER
26. FRYER
27. 30 QT. TRUNION KETTLE
28. 40 QT. JACKETED STEAM KETTLES
29. VEGETABLE STEAMER
30. MIXER
31. HAND SINK
32. WORKTABLE
33. COMPARTMENT FOR GLASS SALAD BOWLS AND PLATES UNDER
34. BREAD DRAWER UNDER
35. SANDWICH TABLE
36. SALAD TABLE
37. WORKTABLE
38. DRINKING FOUNTAIN
39. STORAGE CABINETS
40. HEATER UNITS
41. CONVEYOR BELTS
42. DISHWASHER
43. DISH CARTS
44. INCINERATOR
45. AGITATOR
46. DISHWASHER
47. DISH DRIER
48. DISPOSER
49. CAN WASHING UNIT
50. CAN DRYING RACK
51. SCALE
52. ADJUSTABLE SHELVING
53. PROOF OVEN (PASTRY SECTION)
54. REFRIGERATOR

Hal. Campbell photo



SOILED dishes are scraped and put into the dishwashing machine. When cleansed, the dishes are so hot that they must be handled with gloves.

SCHOOL LUNCH

Equipment and Layout Achieve Mobility

As told by CONSTANCE C. HART
Nutrition Director
School District of Rochester, N.Y.

MOBILITY is a key word in the efficient operation of the lunchroom at the new East High School in Rochester, N.Y. Highly functional equipment and layout were necessary to accommodate more than 2000 students, the faculty, *and* the community.

The lunchroom area is centrally located on the first floor and is easily accessible to all parts of the building and parking and delivery areas. When used for community activities, it can be isolated from the school.

A committee consisting of two faculty members, two lunchroom managers, and the director of nutrition spent months planning the lunchroom. The committee worked with representatives from a utility company, the president of a restaurant, the architects, and equipment dealer.

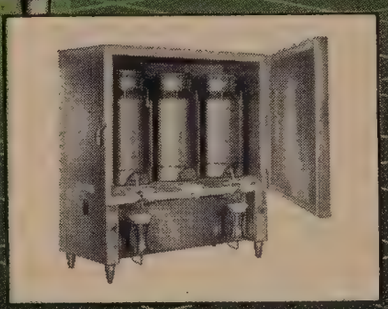
The layout allows a direct route of

(*Continued on Page* 124)

MEETS
3A
STANDARDS

TWO MODELS
10 AND 15 GALLONS
CAPACITY

Model PC-15



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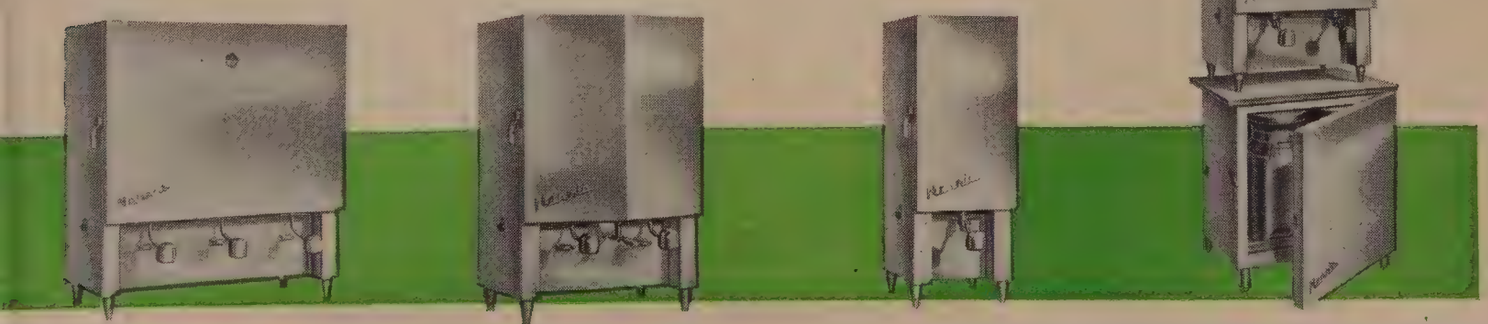

N-15 MANHATTAN
Three 5-gallon cans. 39⅝" high, 37½" wide, 17⅞" deep. Manhattan series includes N-10, two 5-gallon cans, 27" wide and N-5, one 5-gallon can, 16" wide. Manhattan models include temperature indicators.

N-10 MANHATTAN
with creamer. Two 5-gallon cans of milk and a 3-quart cream can. 39⅝" high, 27" wide, 20⅜" deep. Creamer model available in Super series. All Norris dispensers have temperature controls.

N-5 SUPER
One 5-gallon can. 39⅝" high, 16" wide, 17⅞" deep. Super series includes N-15, three 5-gallon cans, 37½" wide and N-10, two 5-gallon cans, at right on stand, 27" wide.

N-10 SUPER ON REFRIGERATED STORAGE STAND
N-10 Super holds two 5-gallon cans. 39⅝" high, 27" wide, 17⅞" deep. N-10 Refrigerated Storage Stand holds two 5-gallon cans in reserve. 34¼" high, 30" wide, 24" deep. Adjustable legs. N-15 refrigerated stand, three 5-gallon cans, 39¾" wide.

For additional information, use postcard facing back cover.

FIAT LUX

THE NATION'S SCHOOLS administration study on lighting, which is featured this month, is important because it throws a great deal of light into an area that has been obscured altogether too long. Until comparatively recent times, many schools were built like the one in Sugartown, where I served a short period in incarceration as superintendent. When the building plans were first exposed, the board indulged in several dim discussions as to how to adorn and beautify the edifice.

After firing three or four architects (and a few administrators just for good measure), one of the antiquarian board members thought up a coat of arms surmounted by the Latin motto: "Fiat Lux." Feeling that the question of illumination thus had been properly disposed of, the board adjourned, presumably leaving the building to be lighted by whale oil lamps.

The resulting civic monument was a matter of great community pride and was pointed out to all visitors. Unfortunately, it could be seen only during the daytime or by candlelight, but this did not seriously deter the use of the grounds for antisocial activities whose purposes were dark and hidden.

The interior of the Sugartown school was, if possible, even more dreary and dingy than the exterior, and the "Fiat Lux" sign covered the only multipaned window in the whole building. The corridors and classrooms were a dispirited emetic brown with a few lively touches of battleship gray.

In fact, the entire color scheme, if any, seemed to symbolize the dreams of a color-blind architect subject to fits of depression on a cloudy night in a London fog. Even the state supervisor of art added a somber touch by decreeing that all wall paintings must be in sepia or brown, and the only painting that won his complete approval was a copy of Gainsborough's "Blue Boy" without the color.

Fiat Lux! The room lighting at Sugartown was controlled by a key given to the janitor with the distinct understanding that he would unlock the lights only in case of a total and simultaneous eclipse of both sun and the moon. The teacher, however, in desperate emergency, could requisition a 10 candle power electric bulb, but by so doing she automatically abrogated her contract for the ensuing year — too expensive!

It is true that the electric bill at Sugartown was nominal or even less, for the business reputation of the superintendent depended upon keeping it that way. On the infrequent celebrations when the public was allowed in the school, there was an epidemic of stumbles, profane language, barked shins, and lawsuits, but no doubt considerable money was saved, temporarily at least.

Thanks to greater understanding, study, research and the vision of experts, most modern schools no longer have to provide a seeing eye dog for every pupil; but there are still enough schools like Sugartown that the companies which provide illumination, color and pleasing surroundings should be able to stay in business for a few years longer. The modern school administrator can scarcely realize how greatly indebted he is to these purveyors of light and sweetness.

SKILLS FOR SUPERINTENDENTS

IN ORDER to become President of the United States, it presently seems important to be able to express, declaim, articulate, orate and kiss all the babies in the emerging suburbs. If this is necessary for such an exalted position, how much more needful are the selfsame skills for a school superintendent.

Whereas the presidency demands these communicating skills only once in four years, the school administrator must be prepared to exercise his oratory every day of the year and many times more often whenever his board of education calls an executive session.

Through television and $100 dinners, a presidential candidate can speak to thousands of expectant officeholders simultaneously, but the administrator must be satisfied with lesser audiences at clambakes, singing societies, mothers' clubs, fourth grade assemblies, beard-growing-old-home weeks, and choir practices. Even on those occasions warning notices are often sent to the members in advance and free transportation is out of the question.

In a word, today's successful superintendent must strive to emulate that Kentucky governor who was recently eulogized in the *Congressional Record.*

"His vocal chords," said the eulogizer, "were annointed with the roar of thunder; the sharp, whiplike clap of lightning; the softness of the coo of contentment of a baby in its mother's arms, and the silver and golden glow of the morning and evening skies."

Any school superintendent endowed thus should rise to noble heights provided he can find a competent ghost writer, a nonsquawk public address system, an extra strength throat gargle, and an audience.

A CHILD GOES FORTH

WITH DEEP and humble apologies to W. W.: "There was a child went forth every day — and the first object he looked upon, that object he became, and that object became part of him for the day or a certain part of the day, or for many years or stretching cycles of years."

The screaming headlines of the morning paper, which were part of his breakfast — the shrill reports of dishonesty, chicanery and the double cross — these became part of the child. (Even the flamboyant advertising wrapped around his breakfast food, the box top premiums of free switchblades, guns and gewgaws, even these became part of the child.)

And as he was jeeped to school, the magazine stands with wares emphasizing glandular abnormalities (anatomies, legs, busts, and hinder parts), these assailed him wherever he looked.

The displays in the lobbies of the movie palaces beckoned to him. Their passions, innuendoes, falseness and garishness envelope him. The strident whine of the sidewalk radio whammed him with stories of infidelities and cut-rate bargains. The flicker of the window television socked him with cruelty, murder and sudden death. All these things became part of that child who now goes forth every day, and will always go forth every day unless someone gets mad and blows his top.

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t. Henry's Elementary Parochial School
Marshalltown, Iowa

Architect: Frederick W. Mast & Associates
Waterloo, Iowa

COST....COMFORT....CONTROL...

were prime factors in ventilating and cooling this school

LENNOX Comfort Curtain System was chosen because it et these basic requirements. In this installation, a central rm air (a LENNOX oil and gas combination) unit supplies cessary heat to the Comfort Curtain Systems for eight ssrooms, as well as to the offices in this new tri-level build-g. A second similar unit handles the occupancy requirements the chapel. The Rev. Roger E. O'Brien, M. A., St. Henry's ministrator, is well pleased with the installation and reports ry satisfactory results.

a air processing unit in each classroom meters precise amounts fresh, heated or return air as required, filters it clean, and distributes it uniformly through functional bookshelf duct sections *across the full length of the exterior wall*. This creates a gentle continuous flow of air that eliminates cold spots, tired air, drafts and noticeable temperature changes. Individual room controls, with day and night settings, permit substantial fuel savings when rooms are unoccupied.

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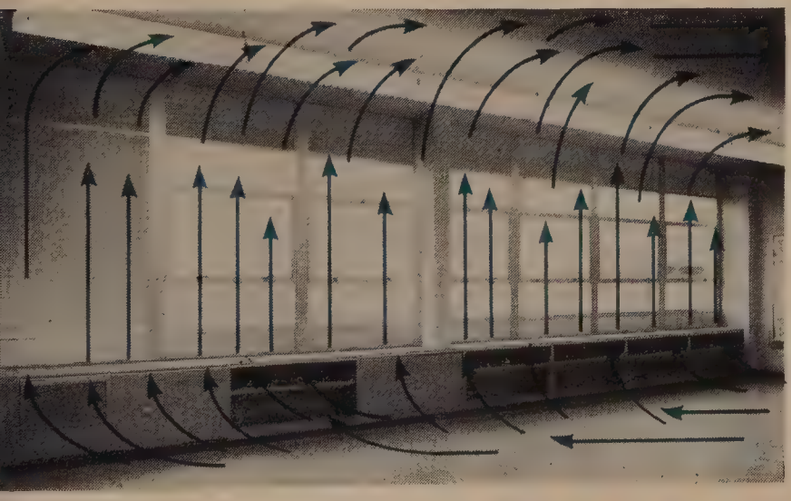

For complete information about the advantages of using a Comfort Curtain System in new buildings or additions to present structures, as well as its adaptability to in-the-room, two-room remote, central warm air, hot water or steam, and heat pump or electric heat sources, write LENNOX, 512 S. 12th Ave., Marshalltown, Iowa. If more convenient, call your nearest Lennox office, listed below, and ask for a technical representative to call.

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Court settles dispute when

Board and Architects Disagree About 'Work' in Contract

LEE O. GARBER
Director, Educational Service Bureau, University of Pennsylvania

SCHOOL BOARDS cannot be too careful in the preparation of contracts, particularly those involving the expenditures of considerable amounts of money. Although a board always should submit all such contracts to its attorney before signing them, this is no guarantee that litigation will not result. Carelessly worded contracts involving vague phraseology are invitations to litigation. Even carefully phrased, properly drawn contracts may generate litigation. Not infrequently, the question at issue may be the intended meaning of a single word or phrase which, standing alone, appears innocent enough.

Such was the situation, in part, in a recent case decided by the appellate court of Illinois.* In this case, an architect brought an action to recover money allegedly due him under a contract with a board of education. When the lower court ruled in his favor and awarded him a judgment in the amount of $34,176.54, the board appealed. The appellate court reversed the judgment of the lower court, ruling in favor of the board. The various transactions, out of which the litigation grew, had occurred over a period of some five years — between May 1948 and August 1953.

Contracts With Architects

On June 15, 1948, the school board decided to enter into a building program for two high schools — one in Lake Forest, Ill., and the other in Highland Park, Ill. The defendant board entered into a contract with Armstrong, Furst and Tilton, architects, for architectural services. The contract signed was "The Standard Form of Agreement Between Owner and Architect." It contained numerous provisions, including the following: "If any work designed or specified by the architect is abandoned or suspended, the architect is to be paid for the services rendered on account of it."

Under the statute the buildings contemplated could be erected only if the taxpayers approved a bond issue. Before submitting the question to them, however, a cost estimate was necessary. This, in turn, necessitated that the plans be perfected by the architect before the bond election.

Early in 1949, the architect proceeded to the point where it was possible to estimate costs. The board asked for a further development of plans and approved a revision of the contract calling for the payment of a total of $25,000 for work performed when such plans were ready, in which revision was suggested in a letter from the plaintiff, dated Feb. 7, 1949.

School Detached From District

A little later, the defendant notified the plaintiff that Lake Forest High School had been detached from its district, and that, as a result, the board would take no immediate action relative to building Highland Park High School. On Nov. 21, 1949, the plaintiff replied that if no more work was to be done on Lake Forest High School, a credit of $1850 would be allowed.

In February 1950, the architects furnished the board with the additional plans. The board acknowledged their receipt and made the final payment on the $25,000 it agreed to pay after an allowance of $1850 because of cessation of the Lake Forest project. The board did nothing more about Highland Park High School until the final court decision, in 1952, approving the withdrawal of Lake Forest High School from the district.

In the meantime, new board members had taken office in the defendant district. The board then re-examined its building needs, taking into account the population increase in the district. It informed the plaintiff architectural firm that it was abandoning the old project as it needed a much larger school.

By this time one of the architects had left the firm. Mr. Furst, a remaining member, together with other architects, appeared before the board for an interview relative to the new project. Following this interview, the board decided to employ a new firm of architects. On Aug. 18, 1952, it so informed the plaintiff, and on Aug. 28, 1952, it notified the plaintiff in writing that it "had abandoned all of the work designed or specified by" the plaintiff, under the contract of June 15, 1948.

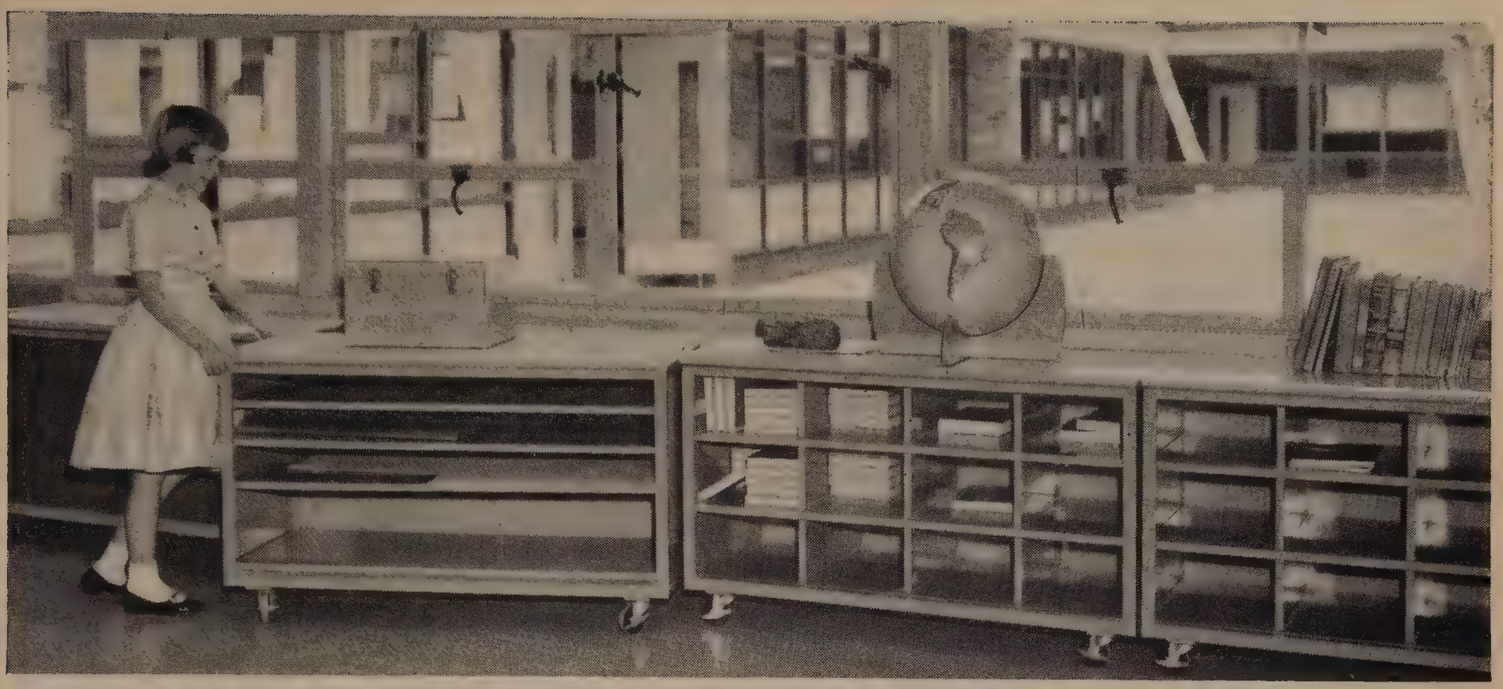
The plaintiff then brought this action to recover what he alleged to be due him, basing his claim, largely, on his interpretation of one section of the contract previously mentioned, namely: "If any work designed or specified by the architect is abandoned or suspended the architect is to be paid for the services rendered on account of it."

The argument between the plaintiff and the defendant grew out of different constructions of the word "work" in the sentence just quoted. This difference is explained in the following quotation taken from the court's decision:

"Defendant urges this court to construe the word 'work' . . . as characterized by the words 'designed and specified' in a limited sense, *viz.*: that if the work product (plans and specifications) of the building designed and specified by the plaintiff is not erected (abandoned) then the plaintiff shall be compensated for his services rendered to that point only. Plaintiff on the other hand suggests the word 'work' to mean the project contemplated in the contract recital for which plaintiff agreed to per-

(*Continued on Page* 108)

*Furst *v.* Board of Education, Highland Park High School District, 155 N.E. (2d) 654 (Ill.). Decision announced by appellate court of Illinois, Jan. 21, 1959.



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Mr. Virgil G. Sheeley, Principal
Guilderland Elementary School

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- **Sliding doors available in steel, hardboard or plastic surface in a variety of Grade-Aid colors and patterns.**

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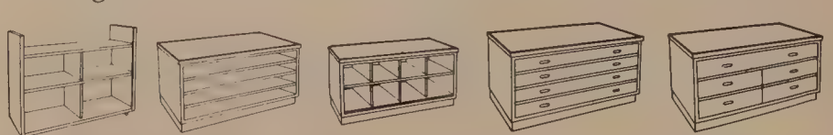
In the Guilderland Elementary School, *all* available space is utilized, with the help of modular, mobile Grade-Aid Classroom Equipment. Versatile Grade-Aid units are designed for maximum utilization of classroom space, simple rearrangement to meet changing space requirements and storage needs. All counter storage models are available in six heights to fit all grades.

All Grade-Aid equipment is constructed of heavy 20-gauge furniture steel for fire safety, durability and economy. It's easy to keep clean and maintain — no warping, swelling or rotting can mar the lasting beauty of steel.

If there's a storage problem in your school, investigate the finest — Grade-Aid Steel Classroom Equipment, including a complete line of sink units, wall and counter storage cabinets and wardrobes.



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School Law

(*Continued From Page* 106)

form professional services 'for the above named work,' *viz.*: 'additions to Highland Park and Lake Forest high schools,' and concedes that if defendant has in fact abandoned the project, plaintiff's recovery would be limited to compensation for work done."

The court looked to precedent. It cited similar cases decided by the higher courts in Illinois, Wisconsin and California. The Wisconsin case was particularly apropos as the court was there "called upon to construe the identical provision in a contract which appears to be one issued by the American Institute of Architects."

In commenting on it, the supreme court of Wisconsin said:

"We think that this clause plainly means that upon abandonment the architect is entitled to commission upon the work done by him up to the time of abandonment or suspension but that the abandonment or suspension is not a breach of the contract permitting him to recover damages for loss of opportunity to complete the contract."

With this reasoning, the higher courts of Illinois and California appeared to agree, in somewhat similar cases. As a result, the court here accepted the reasoning of the courts just mentioned and ruled as follows:

". . . the plaintiff is entitled to be paid for professional services *rendered* to the date of abandonment of the project, namely, Aug. 28, 1952, if there has in fact been an abandonment. Necessarily we must now determine whether or not there was an abandonment of the project *intended* to be erected under the contract of June 15, 1948. If there has been an abandonment in fact, the plaintiff is not entitled to recover any sums in excess of the $25,000 paid in accordance with the contract as modified by the letter of Feb. 7, 1949."

The court noted that, in the original contract prepared by the plaintiff, it was stated that the "owner *intends*" to erect certain additions, and that, as a result of the disconnection proceedings, both parties abandoned the Lake Forest project and the plaintiff was paid for services rendered on it to the date of abandonment. It also noted that the project as outlined originally, as it related to Highland Park High School, was considerably different from the one the defendant decided upon after studying its needs following the withdrawal of Lake Forest High School from the district.

Upholds School Board

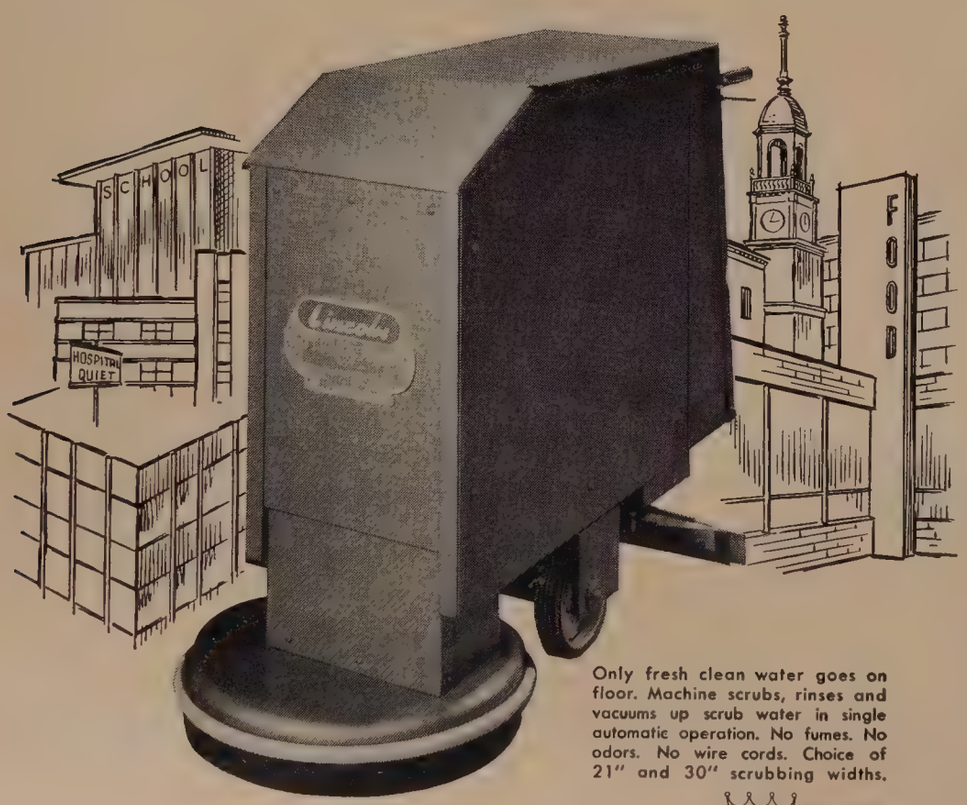
Consequently, the court ruled that the evidence indicated an abandonment of the original project, and that plaintiff was limited to compensation for services rendered only up to the date of abandonment — compensation which he had already received.

Further, the court said: "Under the terms of the contract no reasons need be assigned by the owner providing the architect is *paid for the services rendered on account of it*. Finally, the court noted that if it "were to adopt plaintiff's thinking the owner would be entirely in the hands of the architect if he or she ever wished to carry out his or her general object" — a situation that "could lead to grave inequities which the law will not permit." ■

And Sailing They Go. Some schools around the country are offering a program in boating and boat safety. In 1957, Norfolk, Va., set up the first such program. Since then about 1500 students have completed the course. The response to the program during these three years has been so great that it is now a required course for all Grade 8 pupils.

LINCOLN

battery powered
automatic floor scrubbers



Only fresh clean water goes on floor. Machine scrubs, rinses and vacuums up scrub water in single automatic operation. No fumes. No odors. No wire cords. Choice of 21" and 30" scrubbing widths.

For clean, really *clean* floors, go Lincoln-Wilshire *automatic*. Complete line of equipment for scrubbing, sweeping and polishing floors. A faster, more thorough job for less money.

TOLEDO 3, OHIO

WILSHIRE

LINCOLN FLOOR MACHINERY CO. AND WILSHIRE POWER SWEEPER CO.
divisions of American-Lincoln Corporation...in business since 1903

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STRENGTH

where it counts...
in the

HARDWARE

Get away from coatings and plating, and you have the solid-metal strength and durability that's needed in toilet compartment hardware.

That's why Fiat *LIFE-LINE Harmonized Hardware* is solid-to-the-surface selected alloy . . . aluminum above the floor, stainless steel for floor shoes . . . all in a harmonizing satin finish that blends with any decor.

It's top quality, furnished without exception for every Fiat Enclosure installation because it's been tested and proved best for the purpose.

FIAT

S-2 Alloy Wall Stirrups

S-2 Alloy Top Hinge Bracket

S-2 Alloy Bottom Hinge Bracket

S-2 Alloy Slide Bolt

Stainless Steel Plinth

or new Brochure: "Fiat Toilet ures" to get the facts about T line, as well as architectural and specifications.

FIAT . . . First in Quality Since 1922 . . . Packaged Showers · Floors · Doors / Toilet Room Enclosures

TRATEGICALLY LOCATED PLANTS FOR FAST DELIVERY AT LOWER COST!

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The *most economical* flag you can buy is Dettra's high-quality cotton bunting BULL-DOG brand. Bull-Dog bunting exceeds U.S. Government specifications for Type B cotton bunting on all counts—tensile strength, color fastness and wearability. Bull-Dog flags have been used continuously by the U.S. Government since 1915 when John Dettra submitted samples for tests. As a result of those tests, the Government issued a new set of specifications *based on Dettra's Bull-Dog Bunting*. Insist on Bull-Dog Flags for economy.

Dettra flags and banners available in stock or made to order in a wide range of superb fabrics for indoor and outdoor use. For FREE SAMPLES, literature, prices and name of nearest Dettra Dealer, write Dept. N. 1.

DETTRA FLAG CO., INC.
Oaks, Pennsylvania

No Study Halls

(*Continued From Page* 68)

ing it easier to spot weak teachers and to give them help. As they become more accustomed to the demands and routines of the new program, the teachers are learning which procedures are most effective for the 70 minute period.

Home Study Approved

Homework has increased. Students and parents tell us this, and we observe how many more students are carrying books home. Classroom teachers report that not only is more homework being handled but the quality of the homework is higher.

In the recent year-end evaluation an effort was made to gauge the reaction to the emphasis on homework. Returns showed that the total amount of homework students are required to do was found "about right" by 62.1 per cent of the students, 84 per cent of the parents, and 96 per cent of the high school teachers. Of the 35.2 per cent of students who checked "too much," 60 per cent stated their answer would be the same under a 55 minute program.

Perhaps the outstanding accomplishment of our change-over from study halls to the 70 minute class schedule is this: With less time needed for disciplinary conferences, teachers and administrators can devote proportionately more time to improving the educational opportunities of all students. And that's why we are in business! ■

Superintendents Discuss Population Explosion

NEW YORK. — The impact of the "population explosion" has reached the schools, testified a group of superintendents who met here at Columbia University's 19th annual work conference.

Thirty-seven administrators from 33 states listed some of the pressing problems that they, and probably other administrators, are facing.

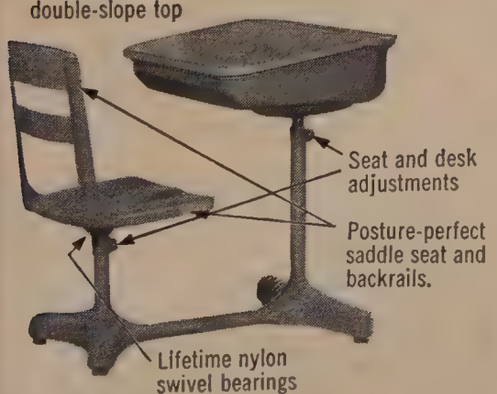
Other problems most frequently mentioned were: the need for better understanding between schools and the public; education of the talented and gifted; school financing; teacher education; obtaining, and above all, holding good teachers; administrative practices, and dropouts from school and related matters.

The school leaders represented small, medium and large school systems.

BECKLEY/CARDY SEATING

designed to meet the tests of time and children...

Enduringly built from 52 years experience in seating children. Posture-perfect design for full-day child working comfort. Modern styling that makes the classroom inviting and colorful.



STERLING DESKS

Carefully planned and engineered to be the *finest working unit* available for today's classrooms. Large writing surface—chair and desk adjustable to fit wide variations in pupil size—chair swivel has nylon bearings for lifetime wear.

Also mfrs. of "MODERNLINE" seating. Write for full description and prices.

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re-tubing bills? not this summer . . thanks to

ACME CHEMICAL

Pete's purring — and bursting with the news that this summer, for the first time in 8 years, we didn't need to replace a single boiler tube.

That happened only once before — the first season we operated the boiler. Other years, our summer inspection always showed 3 or 4 tubes so pitted they had to come out.

Salute to Rustoscale® — and hats off to our Acme Man. It was he who got us started last October on Rustoscale. We never believed our low-pressure heating boiler needed water treatment but their Laboratory analysis of our supply and boiler water showed otherwise. By the time real cold weather came, Pete noticed he was gettting quicker heat — building was cozy those bitter mornings. And now the best news of all — no bills this summer for new tubes!

F. Maintenance of School Plant, cont'd

3. HEATING SYSTEM

	1957-1958	1958-1959	1959-1960	
	Spent	Spent	Budget	Spent
Steam line repairs	529.56	516.13	550.00	649.54
Turbining flues	504.70	521.21	525.00	519.66
Replace boiler tubes	451.42	626.18	650.00	------

Besides lower repair bills, there are other benefits of treating your boiler water with Rustoscale, one of 80 fine products made by the Acme Chemical Company.

ACME Chemical Company
Milwaukee 45, Wisconsin

Maintenance materials for the School Building . . . serviced to your satisfaction

Clerical Pool

(*Continued From Page* 71)

The equivalent of eight full-time (8 hours per day) clerical workers is adequate to serve a school of 1300 students and 65 teachers. The staff will vary, of course, depending on how extensive an aid program is desired.

Test scoring machines rent at about $50 per month. The graphic item counter feature adds $25 to the monthly cost. Stock machine answer sheets cost $6.25 per thousand in 25,000 sheet lots. Essential business machines include: (1) mimeograph, (2) spirit duplicator, (3) typewriters (one per worker), (4) folding machine, and (5) collator. Also needed is a realistic repair and maintenance service program for all business machines, adequate storage for paper and clerical supplies, adequate filing cabinets with locks, and a suitable supervisor who can get the best performance from workers and who is not satisfied with anything but quality work! It is also essential that the supervisor be one who can maintain an attitude of service to others.

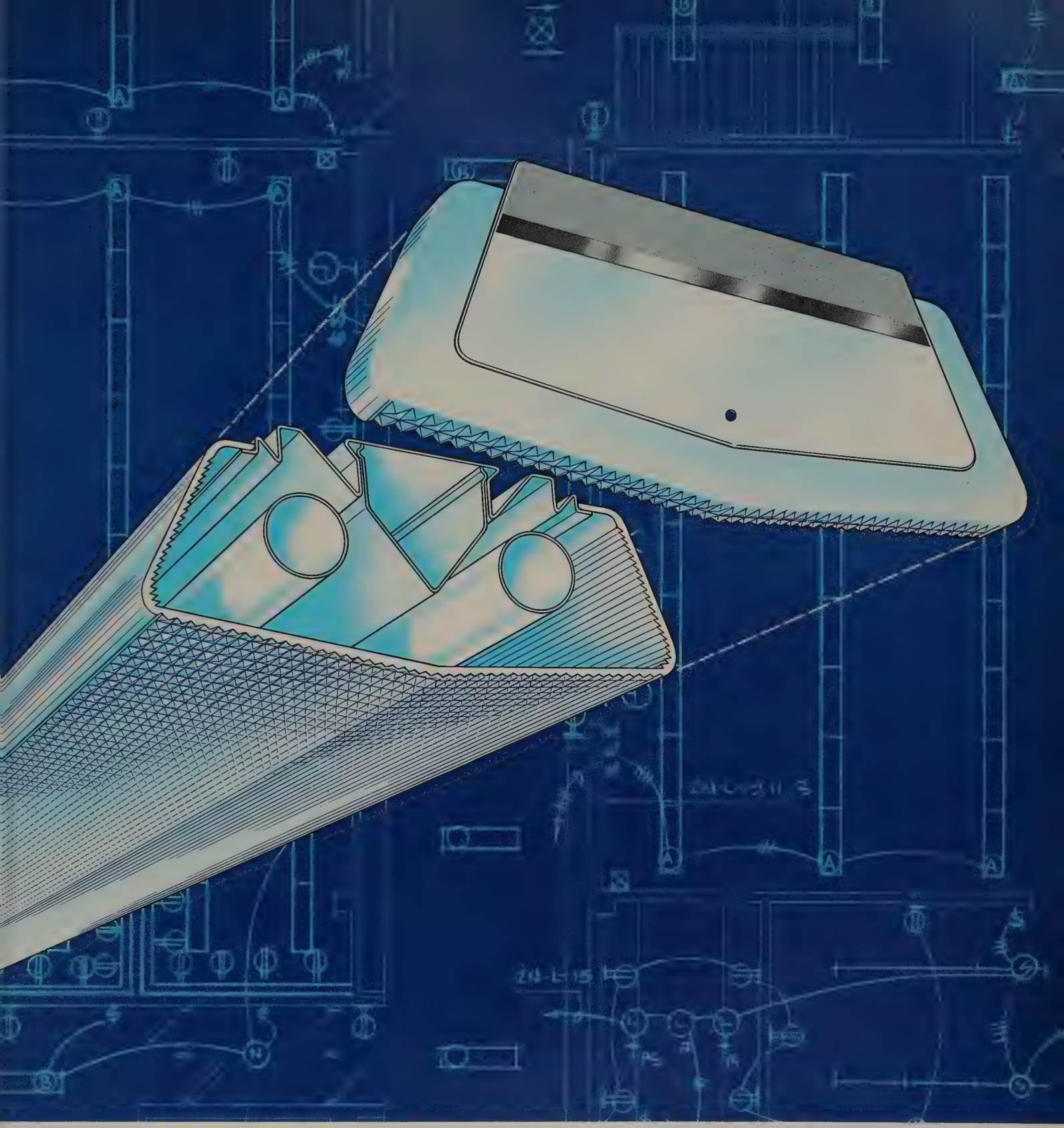
The teacher service program does add to the over-all cost of operation, but it is not prohibitive for a great many schools. The Palatine district is convinced that the money spent on this program is "bread cast upon the waters." It comes back many-fold in terms of decreased teacher work load, higher morale, and better teaching. ■

Proposes Gifted Men Serve as Guest Teachers

SAN DIEGO, CALIF. — State certification requirements technically should not exclude exceptionally talented men from public school classrooms, Paul Woodring, educational consultant to the Ford Foundation, recently told a meeting here sponsored by the National Commission on Teacher Education and Professional Standards.

He suggested that attractive opportunities be given to gifted people in order to encourage them to serve as guest teachers.

"It is not likely that such men will ever want to teach in a self-contained classroom, where they would be required to keep records, take off overshoes, and collect the milk money. But as members of a teaching team, perhaps as television instructors, we can use them and ought to use them," Dr. Woodring said.



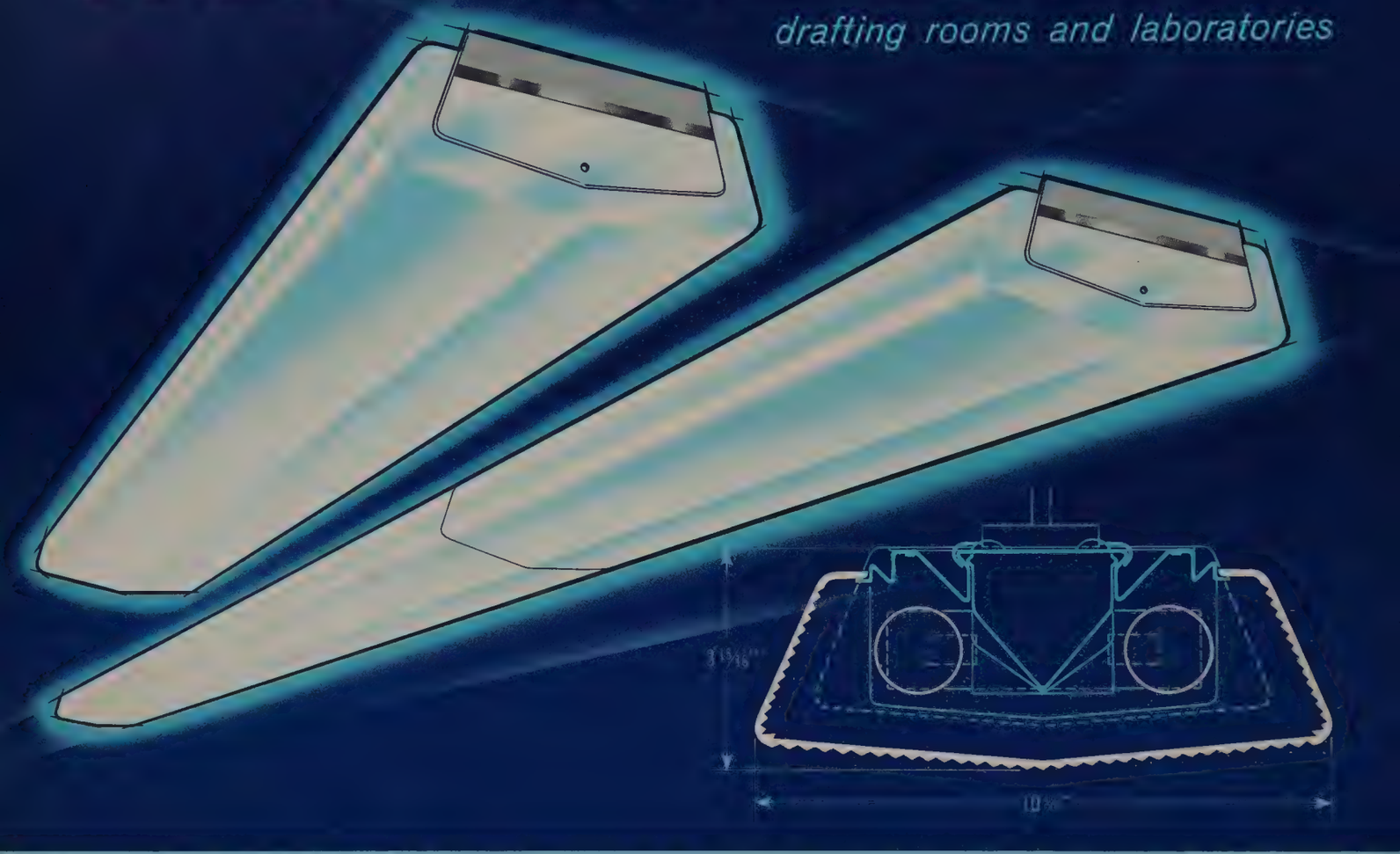
THE PHOTOMETRIC by WAKEFIELD

Four and eight foot luminaires for engineered lighting with off-the-shelf availability and price

The WAKEFIELD PHOTOMETRIC

TRADE MARK

is a completely new injection-molded refracting luminaire for on-ceiling or stem mounting in schools, colleges, offices, libraries, drafting rooms and laboratories



Catalog No. PHR-214 (Styrene) – 4 ft.
Catalog No. PHR-214-AA (Acrylic) – 4 ft.

Catalog No. PHR-218-T (Styrene) – 8 ft. tandem
Catalog No. PHR-218-TAA (Acrylic) – 8 ft. tandem

Wakefield designers and engineers have lavished time and care on the development of the Photometric. The result is a luminaire for those who want the finest engineered lighting in a brilliantly styled package. Here are a baker's dozen reasons why:

1. Beautifully styled injection molded 4′ refractor available in styrene or acrylic.

2. Designed for either close ceiling or stem mounting; sliding clamp hanger to facilitate stem mounting.

3. No opaque metal between units, thus eliminating distracting contrasts when units are connected in luminous rows.

4. Controlled brightness in direct glare zone.

5. Actual over-all depth less than 4″. Four and eight foot units, truly modular in length.

6. Less surface to clean than with louvered fixtures.

7. No-drip ballasts designed to meet newly proposed CBM higher output standards.

8. No visible screws, nuts, bolts, rivets, welds or knockouts.

9. High over-all efficiency.

10. Snap-in-and-off reflector and ballast covers. Snap-in-and-out sockets for easy replacements.

11. Refractor removable from either side without tools or squeezing. No hidden latches or catches—simply lift, slide and remove with hinging action.

12. All steel parts white enameled.

13. CBM/ETL, HPF ballasts. IBEW, UL/CSA labeled.

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WAKEFIELD

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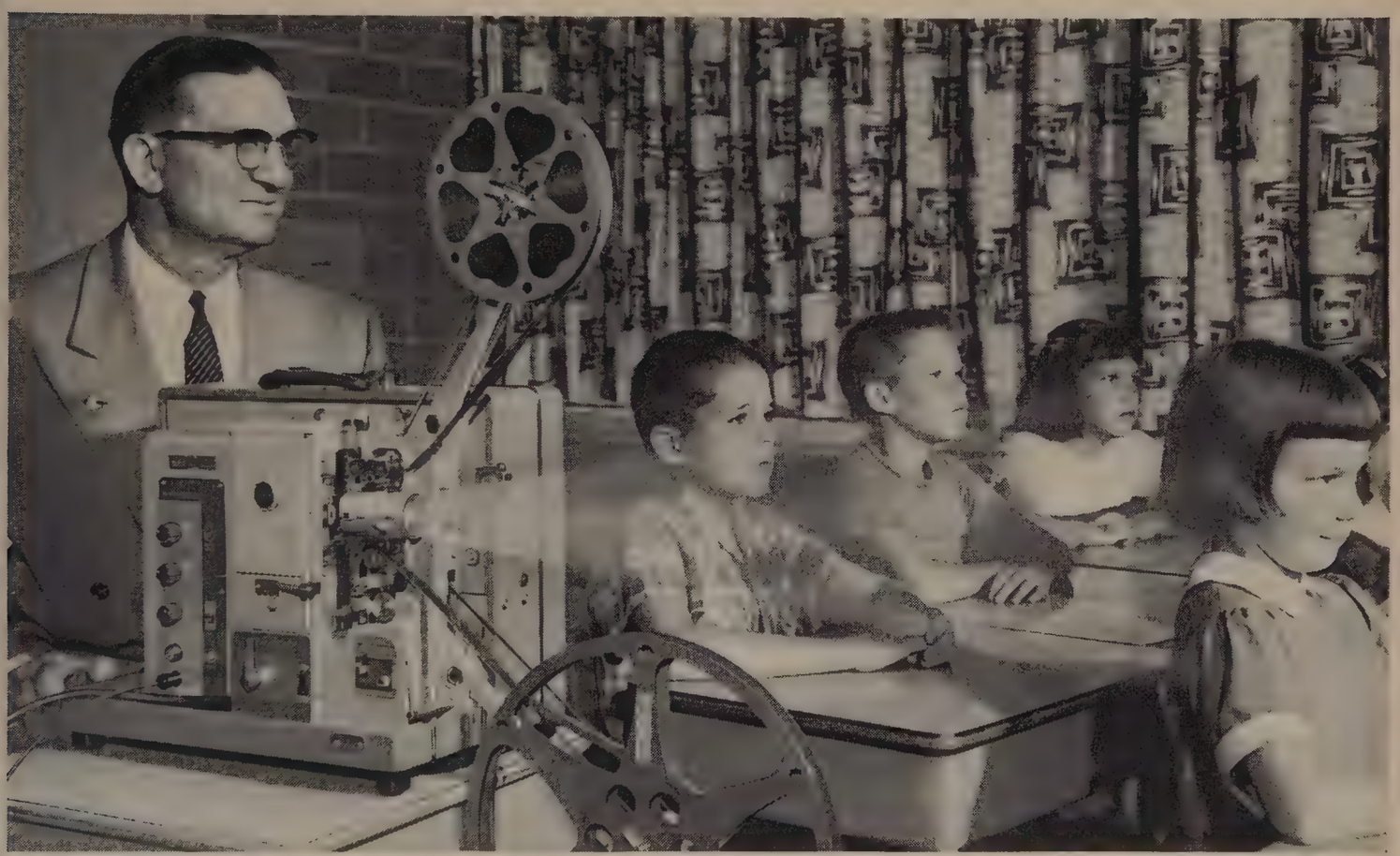
WAKEFIELD LIGHTING LIMITED—LONDON, ONTARIO

LITHO IN U.S.A.

At the new Monroe Elementary School, Monroe, Iowa, selected by A.A.S.A. for its exhibit of outstanding school designs, R. J. Hekel, Superintendent, says:



"We're convinced that A-V increases learning efficiency by 20 to 30 percent."

"Even slow learners grasp meanings quickly when they see a subject in context.

"After showing a movie on rural fire prevention, for example, nearly every pupil readily understood basic concepts of the subject. Before A-V, it was a slow process, sometimes tedious, to drum home the same subject.

"We frequently show movies—and we take care to see that they add to the learning experience.

"To show our movies, we selected the quietest, easiest-to-operate 16mm sound projector we could find—the KODAK PAGEANT PROJECTOR.

"Its quiet operation is not distracting, and we usually don't have to show a new teacher or student more than twice how to operate it with ease. This means we don't have to lose valuable class time.

"We must move our projectors about the school, so we don't like cumbersome, heavy machines. This Kodak Pageant is as light as any we've seen. And we know there's good reason for this projector's weight. For instance, from our examination of the sound amplifier, we found this to be a quality sound system, obviously not skimped on in manufacture. This sound quality is exactly what we need to accommodate showings in either classroom or auditorium."

Test the Kodak Pageant Projector yourself. See how easy it is to set up, how quietly it operates. Call your Kodak A-V Dealer for a demonstration, or write for Pageant Bulletin V3-22. No obligation, of course.

Kodak Pageant Projector 〉 **EASTMAN KODAK COMPANY,** Dept. 8-V, Rochester 4, N.Y.

are green chalkboards really better?

"No!" says a recent article in *BLBS News,* a lively, bi-monthly magazine devoted to the subject of school lighting and related subjects. "No improvement is possible over blackboard and white chalk, either theoretically or practically." This was the unequivocal statement presented by *BLBS News,* which documented its findings with solid facts furnished by a recognized authority in the industry.

BLBS News thrives on controversial subjects . . . doesn't pussyfoot or play favorites. Is automatic light control equipment for classrooms expensive? *BLBS News* quoted actual cost figures. Also provided (in its May, 1960 issue) detailed cost comparisons on 17 different ways to light a classroom. Is it more economical to turn off fluorescent lights when a classroom is not in use? *BLBS News'* answer might have surprised you. Stated the publication: "If the room is to be vacant for 15 minutes or longer, *turn 'em off!"* This, despite the fact that Better Light Better Sight Bureau, the national educational foundation which publishes *BLBS News,* is *supported by the electric industry.*

Want to learn more about the facts of *light?* Begin reading *BLBS News,* the one specialized magazine primarily devoted to school lighting. For your free copy of the latest issue, simply mail coupon below. No obligation, of course.

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Yes, I'd like to find out more about BLBS News. *Kindly send me a free copy of your latest issue.*

MY NAME .....

TITLE .....

SCHOOL NAME .....

SCHOOL ADDRESS .....

CITY ZONE STATE .....

Report From Washington

(*Continued From Page* 13)

Continued support of programs to strengthen basic research in education; to discover the best methods for helping handicapped, retarded and gifted children to realize their highest potential.

The federal government can also play a part in stimulating higher education. Constructive action would include:

The federal program to assist in construction of college housing.

Extension of the federal student loan program and graduate fellowship program.

Consideration of means through tax laws to help offset tuition costs.

For the purpose of strengthening our relationship with the peoples of the Pacific world, we pledge our continued support of the East-West center for cultural and technical interchange in Hawaii.

Federal matching grants to help states finance the cost of state surveys and inventories of the status and needs of their school systems.

Provision should be made for continuous attention to education at all levels by the creation of a permanent, top-level commission to advise the President and the Secretary of Health, Education and Welfare, constantly striving to focus the interest of each citizen on the quality of our education at every level, from primary through postgraduate, and for every age group from children to adults.

We are aware of the fact that there is a temporary shortage of classrooms for our elementary and secondary schools in a limited number of states. But this shortage, due to the vigilant action of state legislatures and local school boards, is not increasing, but is decreasing.

We shall use our full efforts in all the states of the union to have these legislatures and school boards augment their present efforts to the end that this temporary shortage may be eliminated and that every child in this country shall have the opportunity to obtain a good education. The respective states as a permanent program can shoulder this long-standing and cherished responsibility easier than can the federal government with its heavy indebtedness.

We believe moreover that any large plan of federal aid to education, such as direct contributions to or grants for teachers' salaries can only lead ultimately to federal domination and control of our schools to which we are unalterably opposed.

In the words of President Eisenhower: "Education best fulfills its high purpose when responsibility for education is kept close to the people it serves — when it is rooted in the homes, nurtured in the community and sustained by a rich variety of public, private and individual resources. The bond linking home and school and community — the responsiveness of each to the needs of the others — is a precious asset of American education."

ATTITUDES of candidates indicated by legislative records and public statements on education.

The educational platforms of the parties concerning the role of the federal government in education are probably less significant than the personal views of the major candidates. Typical excerpts from their legislative records and statements on the topic are presented here:

JOHN F. KENNEDY

Legislative Record. Senator Kennedy's voting record reflects a belief that the federal government should assume broad responsibilities in assisting the states in the financing of education.

In 1953, he voted for the Hill Oil Amendment, which would have earmarked for education certain federal revenues from leases of submerged oil lands on the continental shelf.

In 1958, he voted for the National Defense Education Act. A year later, he supported a new Youth Conservation Corps program which passed the Senate by a 47 to 45 vote, and which is still pending in the House.

In 1958, acting alone, Senator Kennedy introduced a school construction bill (S. 3179) that authorized: $300 million annually for five years for school construction, federal purchase of local school bonds to an aggregate of $750 million during the five years, and an aggregate sum of $150 million of federal credit assistance to state school financing agencies. This bill incorporated both Republican and Democratic ideas current in Congress at the time, and applied only to public schools.

In 1960, Senator Kennedy voted for the Clark Amendment, which proposed to add funds for public school teachers' salaries to the pending school construction bill. This bill passed the Senate on May 24, 1960, with an annual authorization of $20 per school age child instead of $25 as proposed by the Clark Amendment, and is now pending in the House committee on rules.

Statements on Education. Upon introducing his school construction bill on Jan. 28, 1958 (S. 3179), Senator Kennedy said: "The administration's program and other new proposals in the field of education are intended to increase the production of American scientists. . . . I welcome these proposals and share their objective. But . . . I think it is

(*Continued on Page* 120)

PROTECT HURRYING STUDENTS WITH **SLIP-RESISTANT** BRISTOLITE WAX

It happens, even in the best of schools. Late arrivals make corridors look like the scene of a track meet. That's why Bristolite Floor Wax is becoming popular with more and more maintenance men.

Bristolite wax is designed to beautifully maintain a floor for long periods, even under difficult use conditions. It is an all-purpose wax formulated with three primary qualities in mind: it must be slip-resistant for safety, remain glossy under heavy traffic, and dry without water marks for ease of maintenance and long protective life. Bristolite has a tough surface which requires less buffing, mopping and stripping.

See our representative, the Man Behind the Huntington Drum, for full details.

Where research leads to better products... **HUNTINGTON**

HUNTINGTON LABORATORIES • HUNTINGTON, INDIANA • Philadelphia 35, Pennsylvania • *In Canada:* Toronto 2, Ontario

Mr. R. P. Diehl—District School Administrator,

Random Lake, Wisconsin—says:

"We compared them all and Honeywell Clock System

found the easiest-to-set by far."

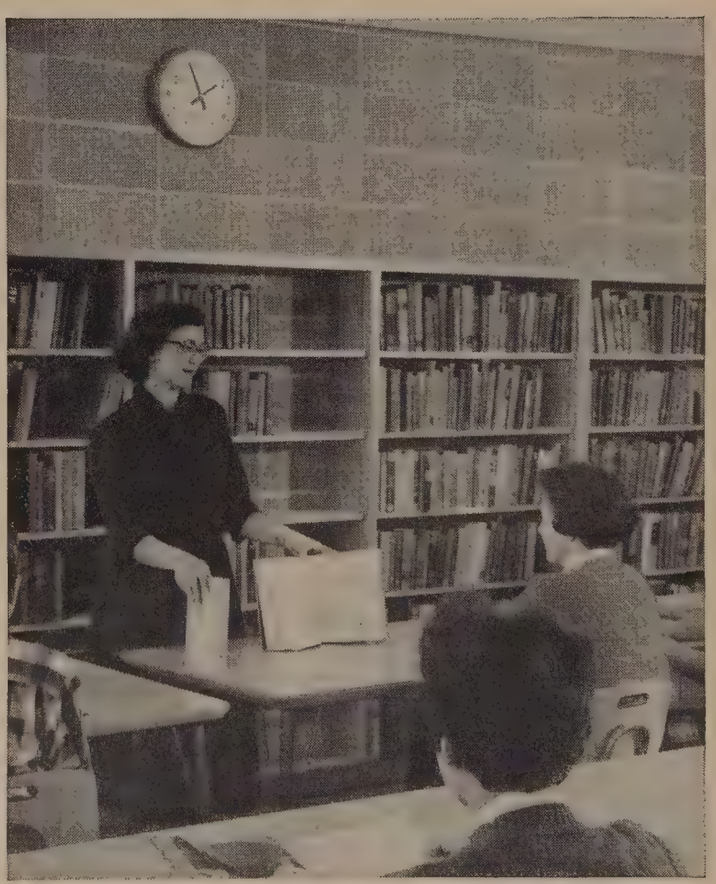
Mr. Diehl had a Honeywell Clock and Programming System installed at Random Lake High School because it adjusts easily . . . needs no specialized knowledge or technical help!

"We've eliminated the fuss and bother of program setting with our new Honeywell System," says Mr. Diehl. "It's so simple to set, and so easy to change. Now, our bell ringing program can be completely tailored to suit school activities. Every clock in our building shows the correct time because the Honeywell Master Clock automatically checks the accuracy of each clock every hour."

The Honeywell Clock System can provide *your* school with the same trouble-free programming. And, it makes your school program more flexible because you can change a signal without changing or resetting any other part of the program. Master time and master signal units are positively linked so there's no chance for them to get out of step.

In addition to the Clock and Programming System, Mr. Diehl had a Honeywell Fire Alarm System installed in the Random Lake School. This 4-way system includes automatic protectors, manual stations, local alarm and automatic notification of fire department—assuring complete, fail-safe protection against fire.

Honeywell backs up *all* its systems with the most dependable, nation-wide service possible. A Honeywell expert is always available to help in planning and installation, and you'll find there's one of Honeywell's 112 sales and service offices as close as your phone! Call your nearest Honeywell office today. Or, write: Minneapolis-Honeywell, Department NS-9-53, Minneapolis 8, Minnesota.



In the event of power failure, *independent correction* assures that each clock in the entire system will be automatically brought into step with all other clocks.

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First in Control

SINCE 1885

75th YEAR PIONEERING THE FUTURE

For that Floor You Really WANT

DIAMOND HARD

NORTHERN MAPLE

Woodworking Shop, Sr. High School, Oneida, N. Y.—Arch., King & King—Installer, Floor Contracting Co., Inc., Syracuse, N. Y.

Don't Just "Wish"

Take Woodworking shops — 30% of the school districts covered in a recent impartial survey report they have at least one Woodworking shop floored only with bare *Concrete*. Of these, over half said they "prefer" *Hardwood Strip*, but —

Don't be defeatist! Accent the positive! More than 60% of the district school shop superintendents reporting say they actually *have Strip* or *Block* floors.

Point Out Savings

Superior resilience, dent resistance, shock and vibration absorption are what make Wells DIAMOND HARD Northern Maple "right" for most shop areas. In these qualities, 2nd and 3rd grades are identical with the clear-grained 1st grade prized for ballroom floors — and cost 10% to 50% less!

Cite Facts

Use this data from school shopmen coast-to-coast reporting kind of floor they now **have** — kind they prefer — with percentage for each (Hardwood, Concrete, Tile, etc.) and for each of 8 major shop areas (Woodworking, Printing, Elec., etc.) — **WRITE**

J. W. WELLS LUMBER COMPANY

Menominee 4, Michigan

(*Continued From Page* 116)

high time, . . that we enact at this session of Congress a bill which will not only direct immediate attention to the production of scientists, engineers and mathematicians, but also will improve the educational standard of all Americans."

In his acceptance speech in Los Angeles on July 15, 1960, Senator Kennedy made the following statement:

"You have . . . placed your confidence in me, and in my ability to render a free, fair judgment — to uphold the Constitution and my oath of office — and to reject any kind of religious pressure or obligation that might directly or indirectly interfere with my conduct of the presidency in the national interest.

"My record of 14 years supporting public education — supporting complete separation of church and state — and resisting pressures from any source on any issue should be clear by now to everyone. . . .

"I am telling you now what you are entitled to know: that my decisions on every public policy will be my own — as an American, a Democrat, and a free man."

RICHARD M. NIXON

Legislative Record. The recent legislative record of Vice President Nixon is confined mostly to the school construction-teacher salary bill (S. 8 as amended), passed by the Senate and now resting in the House committee on rules. The vote on the Clark Amendment in the Senate was 44 to 44, thus giving the Vice President an opportunity to break the tie. He did not vote and thus let the Clark Amendment die. Then came another tie vote on tabling a motion to reconsider the amendment, and the Vice President broke the tie by voting to table. Although the Vice President was obligated politically to vote as he did because of administration policy, he has made it clear that his personal view was in accord with the policy.

Statements on Education. Vice President Nixon has discussed the federal role in education frankly in recent months. Commenting on federal financing of education at a student-faculty panel at the University of Florida on Jan. 15, 1960, the Vice President said: "Education, of course, is a matter of federal concern as well as state and local concern, but what we want is the best education that can be produced. The best education, I am convinced, that can be produced in this country will be through keeping the responsibility as close to the people as possible; to provide for diversification and to get away from the drab uniformity that a federally controlled program would inevitably bring."

At a news conference in Detroit on Feb. 15, 1960, the Vice President said: "Our problem in the case of federal aid to education is how do we reconcile these two problems: (1) Teachers should be paid more, and (2) the fact that we do want local control rather than federal control. It is my opinion . . . that there is a way to reconcile it. . . . The federal government should limit its aid in the case of education to construction, because where construction is involved, there is no color of control whatever. . . . If the approach of the Congress . . . is one which provides direct subsidies to teachers, there will be no aid to education this year."

To an audience of students and businessmen in Detroit on the same day, Vice President Nixon said: "Now, let me also refer to another phase of the question with regard to the support of our local and primary public schools. I often have people come to Washington, members of some of our great business associations, who say: We are unalterably against federal aid to education, period.

"They are honest in this opposition. They are against the school construction provisions which I favor, which the President favors, . . because they think even that much federal aid might result in federal control. They say this is a local responsibility.

"And then the same people go back and vote against the school bond that will build the school or provide the necessary funds for teachers. That is completely irresponsible, and that is the kind of activity that has to be avoided and has to be worked against. If the local communities won't raise the standards, the inevitable result is going to have to be, of course, a federal program, and this most of us believe would be a mistake."*

On May 15, 1960, the Vice President was asked on a national television program why he had voted against the Clark Amendment. He replied that it was because he is convinced that ". . . when the federal government aids in the construction of schools, there is no possibility whatever of federal control. If the federal government gets into the business of subsidizing generally throughout the country the operation of our schools, including the payment of teachers' salaries, inevitably we will move into greater and greater programs in this area."

LYNDON B. JOHNSON

Legislative Record. Senator Johnson supported the Hill Oil Amendment in 1953 and the general aid bill sponsored

(*Continued on Page* 122)

*We are obligated to the staff of *Congressional Quarterly* for these quotations and for other factual materials.

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(*Continued From Page* 120)
by Senator Taft and others (S. 246), which was approved by the Senate on May 5, 1949, by a 58 to 15 vote. On Aug. 13, 1958, he voted against Senator McNamara's school construction substitute for the National Defense Education Act and then for the act itself.

Senator Johnson supported the Clark Amendment and the final Senate version of S. 8 now pending in the House committee on rules.

Statements on Education. In his statement to the Senate immediately before the passage of the N.D.E.A. in 1958, Senator Johnson said: "We are about to act on one of the most important measures of this or any other session . . . one investment in which the United States can never lose . . . is the investment in the minds of our young people. . . . It would be a mistake to consider this measure solely from the standpoint of national defense . . . we would live within narrow and limited horizons if we thought that security was a matter of weapons alone.

"Security consists of people who are alert, people who are vigilant, and people who are trained to cope with the tremendous problems of the modern world. We cannot cope with those problems unless we have men skilled in . . . all of the natural sciences, but neither can we cope with them if our training is solely in the natural sciences. . . .

"The time may come when we will have to take up arms once again to defend our heritage. But we must know what it is that we are defending, and even more important we must know the kind of world which we wish to extend and create so that our descendants can live in peace and progress."

On Feb. 4, 1960, immediately after the Senate had passed S. 8 as amended, Senator Johnson said: "Mr. President, this is a very proud moment for the Senate. In two working days we have passed one of the most far-reaching and most constructive pieces of proposed legislation in which it has been my privilege to participate since I have been a member of this body."

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"Biggest economy news since the Turn-Towl itself!"

You're looking at the first anodized aluminum cabinet on the market and its built-in advantages: no rust or wear, easy to clean, won't show fingerprints.

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HENRY CABOT LODGE

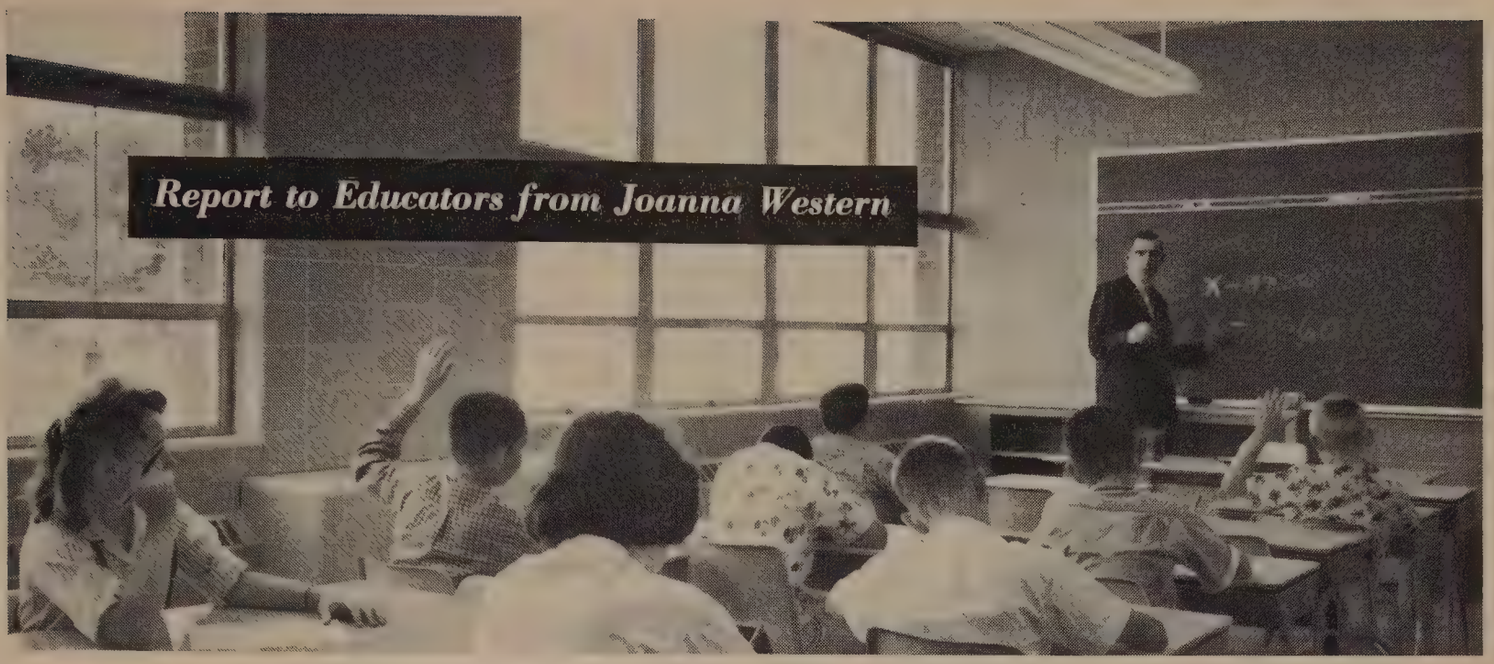
Legislative Record. The voting record of Ambassador Henry Cabot Lodge on education necessarily goes back to his days in the House and Senate. In 1947 he voted to establish the National Science Foundation. In the same year, he voted against an amendment to a revenue bill that would have permitted teachers to deduct tuition and other necessary educational expenses from their federal income tax.

In 1948, during consideration of a general public school aid bill (S. 472), Mr. Lodge voted against an amendment to prohibit the use of federal funds for sectarian or private schools. Then he voted for another amendment to earmark federal funds for private school pupil transportation, health examinations, and textbooks. The Senate rejected both amendments. In the vote on the bill itself, Mr. Lodge cast a minority vote as the bill passed the Senate by a 58 to 22 margin on April 1, 1948.

In 1949, however, the Senate passed a somewhat similar general aid bill (S. 246), by a 58 to 15 vote, and this time Mr. Lodge voted with the majority. During the debate on this bill he also voted against a proposed amendment to provide federal funds for the construction of school buildings only.

In 1950, the Senate voted a $3.5 million increase for vocational education. In two procedural votes following this action, Mr. Lodge opposed the increase and sought without success to bring about a reconsideration.

Statements on Education. As far as we have been able to discover, Ambassador Lodge has made no public statements in recent years concerning the role of the federal government in education. His work for nearly eight years has been largely confined to the international scene, and his position on federal participation in education hasn't been defined. ■



At Ralph Waldo Emerson Junior High School, Niles, Illinois . . .

. . . bright-to-dark shades convert classrooms to audio-visual rooms—fast.

How to Control Light...to Light up Young Minds

Students get a smooth flow of ideas at Emerson Junior High. One reason is that classes *stay put* for their 3 weekly audio-visual periods.

"These new Joanna Western opaque shades let our teachers fuse lesson presentations and audio-visual materials without interruptions caused by moving the class to a projection room," says Mr. Russ Miller, Buildings and Grounds Superintendent, District #64, Park Ridge, Ill.

Emerson's 9 classrooms are all equipped with Joanna Western "Exlite" shades. Twelve more classrooms now being built will have them, too. Joanna Western construction is so simple and rugged that students themselves draw the shades quickly without risk of damage.

Mr. Miller says, "Shades for our 21 classrooms will cost $2,000. This is a saving of $3,000 over individual black and translucent shades. It is a $2,000 saving over fiberglass drapes."

No matter what kind of light control you're interested in, Joanna Western makes a specialized product to fit your needs. Have your secretary mail the coupon at the right for complete information.

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World's largest manufacturers of window shade products

VINYL EXLITE is washable, flame resistant. Comes in 5 colors, widths to 77 inches. Exlite is just one of many window shade and louvered shutter and door products made by Joanna Western.

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Since 1896

School Lunch

(*Continued From Page* 102)

traffic from the delivery area to the storeroom, walk-in refrigerator, food preparation area, and serving counter. Adjacent to the kitchen area are locker rooms for the workers; the dietitian's office is glass paneled and overlooks the kitchen, enabling her to supervise each department.

Mobile storage units speed preparation and service. The storeroom is near the entrance with doors at either end so that it is accessible to all stations. It is equipped with adjustable shelves around the room and a platform scale. A large walk-in refrigerator with two freezers, also located at the entrance, acts as a central storage locker for 15 schools. The refrigerator has mobile shelving units, and the food is sorted when placed on the shelves so that the units may be rolled intact to the departments where the products will be prepared.

The kitchen is departmentalized for efficiency of operation; each preparation area is compact. Six individually controlled baking decks and a four-burner unit for making frostings comprise the pastry section, along with spice bins, portable storage bins for flour and sugar, and a proofing oven. The range section is equipped with a bake or roasting oven, two ranges, one broiler, a fryer, and kettles. Worktables in the salad and sandwich section have features that facilitate the performance of duties in that area—a deep drawer for storage of extra loaves of bread and a refrigerated compartment.

Strategically located are a pot and pan room housing the dishwasher and drying machine and a garbage disposal section. Sinks in the pot and pan room have overflows and lever handle wastes; one has an automatic agitator to loosen food from kettles. Separated from the kitchen, the food waste can-washing room has a three horsepower disposer and an automatic can-washing unit and drying racks.

As the school is to be used as a community center, a snack bar has been provided and will be used to serve food for community functions and for some student activities.

Serves 800 students in 30 minutes. Selection and layout of equipment permits about 1600 students to be served in two half-hour periods with a half hour between periods for resetting. Four service lines accommodate each group of 800 students. Each section of the counter is

(*Continued on Page* 128)

Hal. Campbell photo

DISHES are scraped, rinsed and stacked in trucks before going to the dishwasher. Teachers return soiled dishes through the opening shown at left. Belts bring soiled dishes to the scraping and dishwashing rooms.

62

STANDARD WALL UNITS

197

STANDARD BASE UNITS

200

STANDARD TALL UNITS

PLUS...

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FLEXIBLE TALL UNITS
with interiors
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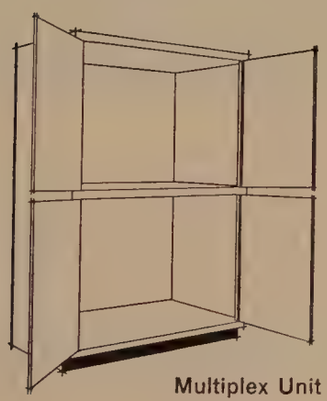

Multiplex Unit 35421

The unit shown above has 11 different optional interiors for the top half; the same number for the lower . . . a total of 121 possible combinations. Though not 11 in each instance, each of the 69 units has the same kind of possibilities. You can readily see the number of interior facilities available soon becomes astronomical in size.

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Mutschler has broken all design barriers for homemaking facilities, as well as for many other types of school storage. MULTIPLEX units are of institutional construction . . . made from finest northern hardwoods with the toughest of catalytically applied finishes that are extremely resistant to damage by water, alcohol, lemon juice, cleaning solutions, or whatever. Available in any of 16 decorator colors or 5 different wood-grain finishes.

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We are planning: ___ new school; ___ remodeling job.

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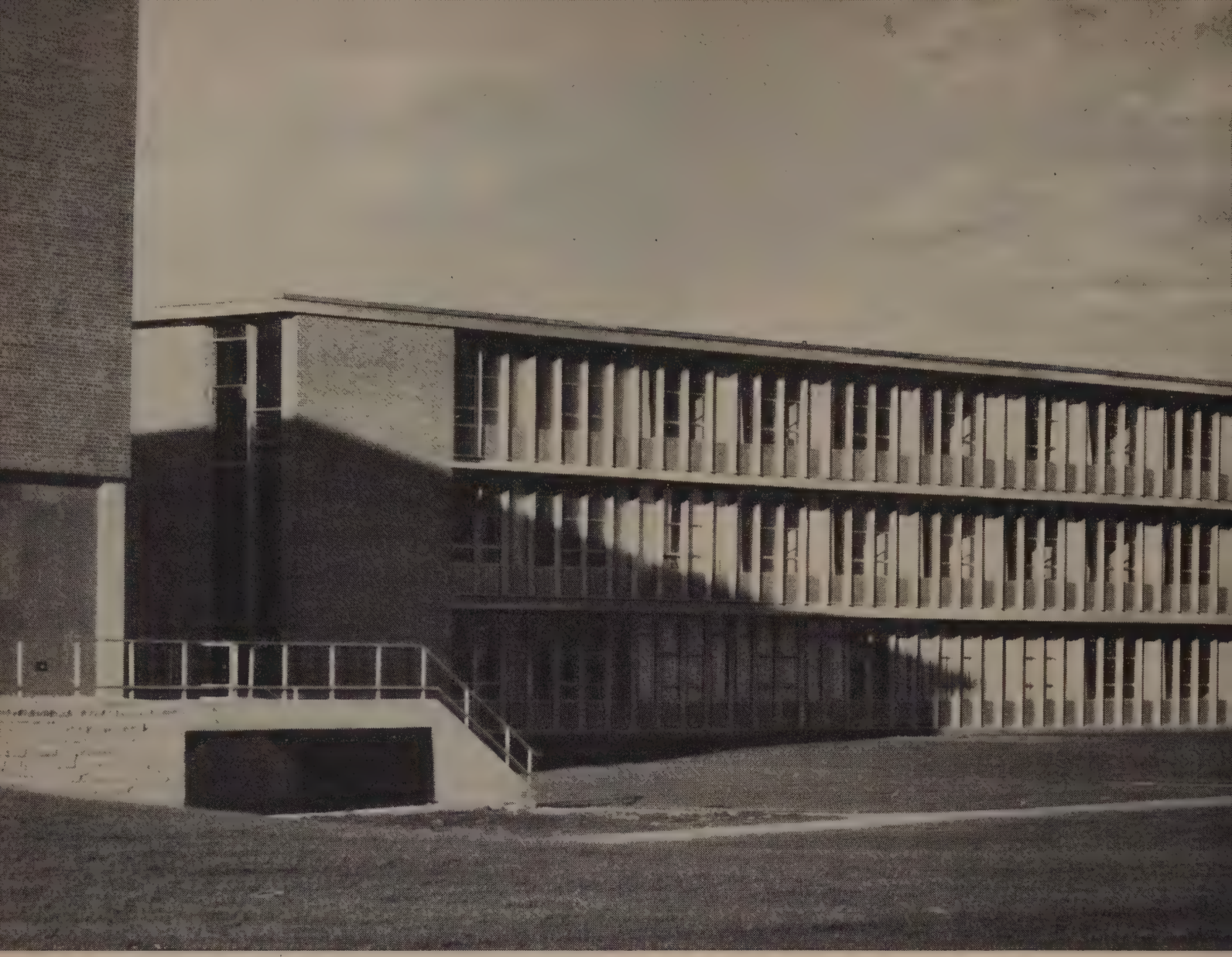


TRUSCON VISION-VENT CURTAIN WALLS FIT PROVISO WEST'S PARK-LIKE SETTING

A big school with a small school atmosphere is the way they describe the new Proviso West Township High School, Hillside, Illinois. Occupying a site of 60 acres, the school includes six major functional units grouped around a central mall. Walls are Truscon Aluminum VISION-VENT®.

Many newer schools are going VISION-VENT. Erection is fast, economical. And VISION-VENT skin-type construction provides more usable floor space, reduces weight on frame and foundation. Exterior walls are strikingly modern and beautiful.

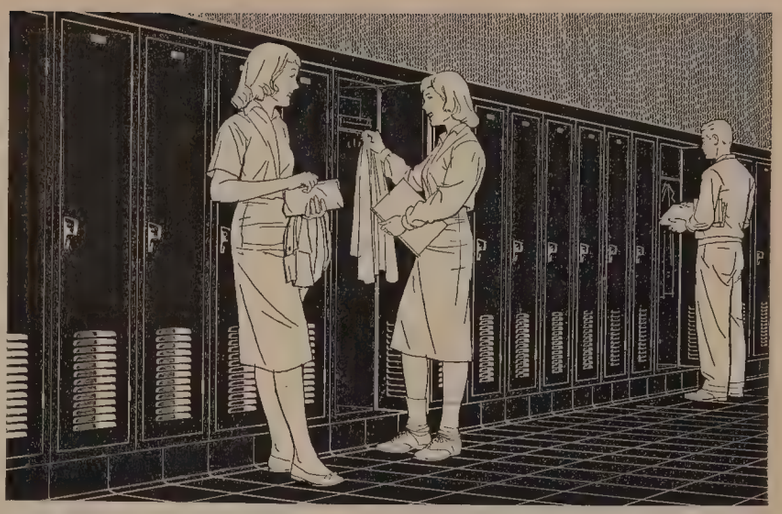
Use of VISION-VENT Curtain Walls assures higher natural light factor, good fire-resistance and insulating value, better ventilation. Panels can be provided with louvers for heating or ventilating systems.

VISION-VENT Curtain Walls offer a selection of practically any type of window—double-hung, intermediate projected, and many others in steel and aluminum. Trim modern appearance. VISION-VENT is available with a choice of high-gloss panel colors, porcelain enamel, stainless steel, or aluminum.

For all the advantages of modern curtain wall construction—combined with the exclusive feature of ventilated, insulated panels integrated with heavy-intermediate steel windows—investigate Truscon VISION-VENT. Send coupon for full information.

Proviso West Township High School—Hillside, Illinois
Architects: Perkins & Will
Contractor: Powers Construction Company
Product: Truscon Aluminum VISION-VENT Curtain Walls

REPUBLIC PERSONAL STORAGE AND WARDROBE CABINETS solve many school storage problems. Big and roomy, ideal for storing week-to-week school supplies for efficient classroom operation with facilities for instructor wardrobe convenience. Select from a wide range of sizes and styles. Six attractive colors. Available for immediate delivery. Write for attractive catalog.



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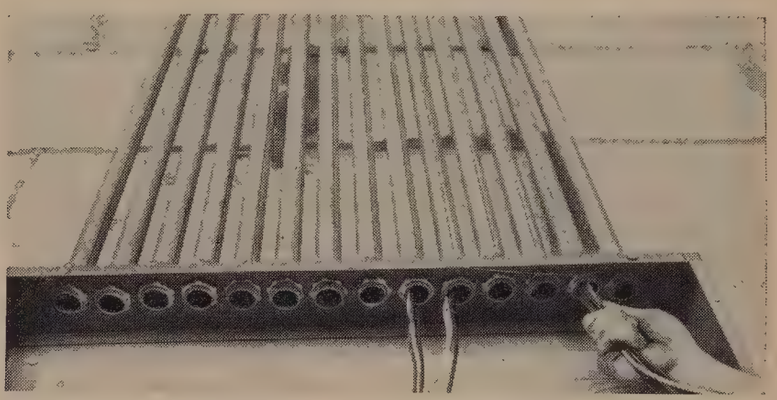

THE *BEST* COSTS *LESS* INSTALLED . . . Republic ELECTRUNITE® Electrical Metallic Tubing, in the next larger size, provides a pull-in, pull-out, electrical system with built-in capacity for future electrical expansion. And ELECTRUNITE E.M.T. features economies in installation that result in more building per building dollar. Ask your electrical contractor, or write direct for more information.

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(*Continued From Page* 124)

equipped with five hot food wells with stainless steel liners and a master control that can turn off all five units. These electric hot food wells are independent of one another and each is thermostatically controlled. A glass protector and stainless steel over the shelf afford protection to the area.

The back of the unit is extended as a serving shelf, and stainless steel angle slides below receive the pans that fit into each well. Adjacent are the built-in automatic leveling milk conveyers. These are self-contained refrigeration units with a remote compressor. These units are equipped with a cover and wire racks so that any milk not used may be kept cool until the following day.

A three-inch deep, 16 gauge stainless steel cold pan is located adjacent to the milk conveyer. Above the cold pan two glass display shelves are protected with sneeze guards. Below it is a refrigerated storage section. The cold pan and storage section may be independently controlled so that the cold pan may be turned off when not in use.

Adjacent to the cold pan is a dessert section with display shelves above. At the end of the counter, just before the cash register and checker's table, are the silver, straws and napkin holders. The tray slides are mounted on the front of the cafeteria section with enclosed end pile.

Students who carry their own lunches may purchase milk without going through the service line. Two portable milk storage self-leveling units are located near the entrance of the lunchroom to accommodate them. Each milk unit has a portable cashier's stand and the traffic is controlled by portable stanchions with ropes. When the lunchroom is not open, students may buy milk from a milk vending machine located in the corridor.

Automatic conveyer belts take all dishes and trays to the scraping room and to the dishwasher. In the scraping room dishes are prerinsed, stacked in carts, and conveyed to the dishwasher, which is equipped with a drying agent that ensures spotless and clear dishes. The unloading platform of the machine is serviced by carts that are fed directly under the service counters in the dining areas, making direct transfer of clean dishes to areas in which they will be used. There is no additional handling, which eliminates excessive labor costs and breakage.

Steps cut, dollars saved. Any equipment that has multiple use has been put on wheels. A slicer, meat chopper, vegetable cutter, and small mixer are mounted on portable tables so they can be moved from one department to another. The number of steps and speed of walking were considered in regard to the dollar hourly rate. Using mobile equipment has saved approximately $5000 a year in employe costs.

All sections are equipped with two-compartment sinks. Facings on equipment are flush with the frame; handles are recessed.

The students' dining area is rectangular with windows and doors on the opposite sides of the lunchroom to provide light and cross ventilation. One wall overlooks a flower-shrubbed patio. The ceiling in the lunchroom and kitchen area is acoustically treated. Walls are light green; the floor of vinyl plastic tile is two shades of green. The counter service area is more highly illuminated than the rest of the lunchroom, making it the focal point of interest.

Laminated plastic top tables are birch color with metal legs. Individual tables seat six and are arranged in aisles to facilitate traffic to counters. Chairs match tables and are equipped with racks for books.

A wall separates the serving counter and the lunchroom area with entrances and exits spaced according to the counter lines. The dining room can be divided by a roller track door extending from floor to ceiling.

The faculty dining room has two shades of pink and gray in its color scheme. Adjacent to the kitchen, the room has a plastic draw curtain in one corner to accommodate small luncheons or conference groups. The counter setup is similar to the students' dining room. The back deck is equipped with coffee makers, a large grill, and a toaster.

Both the faculty and students' dining rooms have pass-through refrigerator storage.

Definite plans and specifications made well in advance, plus consultations with experienced food service equipment dealers, architects and others — these are illustrations of the careful planning that makes possible maximum use of materials at Rochester's East High School. ■

New, low-priced mobile folding table

Keep costs down with this economy-priced, mobile folding table—the new HOWMATIC "TN." Available in 4 sizes.

Solving your cafeteria problems on a limited budget isn't difficult. The trick is to do it without compromising on essentials.

When it comes to budgeting for your cafeteria tables, skimping's unnecessary. Not with the new economy-priced HOWMATIC "TN" available.

For all that, the new HOWMATIC "TN" offers you features available in no other table in its price range! To cite a few:

1. The HOWMATIC "TN" opens or folds in one, easy motion. Either action takes just 3 seconds. Here's why:

Folded, the HOWMATIC "TN" stands on castered legs. These free-wheeling casters roll smoothly, easily, making the unit a snap to fold or unfold.

When the HOWMATIC "TN" is folded, rubber-capped center legs remain free of the ground. The moment the table is fully open, however, these center supports come down automatically, grip the floor firmly, anchoring the unit.

2. Strength where it counts. The HOWMATIC "TN" is built around the same type of durable, all-steel chassis for which HOWE tables are noted. Steel rivets join this chassis to the table's 14-gauge tube steel legs permanently.

Chassis and legs are finished with a bright, rustproof, Cadmium plating that won't chip, never requires repainting.

3. Durable top. The HOWMATIC "TN" comes with a *solid*, built-up top consisting of a plywood sheet covered with a layer of plastic laminate. (Your choice of patterns.) A hardboard backing adds extra strength. The entire top is trimmed with a plastic flush edge.

4. Compact and maneuverable. The HOWMATIC "TN" handles easily. 3", hard rubber, swivel casters insure maximum mobility—important when moving a table through crowded corridors.

Rustproof bearings assure long life, quiet, smooth, trouble-free service.

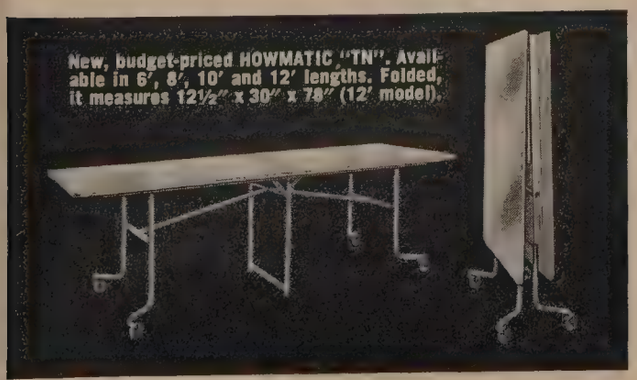
5. Safety features. Counterbalanced spring construction holds the unit in check, keeps the HOWMATIC "TN" from suddenly snapping open or slamming shut.

A 7/8" safety gap where the top's two halves would meet eliminates the danger of injured fingers. In addition, the HOWMATIC "TN"s top has 2" radius safety corners.

Another safety feature is the table's low center of gravity. When active youngsters get playful or the folded unit is moved about hurriedly, the HOWMATIC "TN"s design keeps table from tipping.

6. Saves valuable school activity time. No need to clean the HOWMATIC "TN" before folding and storing. At all times, surfaces are easy to reach and clean. In addition the unit's single-fold structure and 7/8" center seam eliminate corners where food particles otherwise might accumulate.

7. Seats pupils comfortably. The HOWMATIC "TN" seats from 8-18 pupils comfortably depending on whether 6', 8', 10' or 12' units are used.



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Research

(*Continued From Page* 83)

It is known that when the sun is high in the sky it is not glaring, but if it is at the horizon it is blinding. Thus, the greater the angle of the light source above the line of sight, the greater the brightness that can be directed toward the eye without glare.

The foregoing was developed for linear light sources, such as fluorescent luminaires, either in individual mounting or continuous lines. For large area sources, such as complete luminous ceilings, the glare criteria from the laboratory do not apply. Studies for determining the discomfort glare from large area sources are being done at Cornell University and at the Building Research Station in England under the supervision of R. G. Hopkinson.

In the work to date the observer faces a large source (7 by 7 feet) and is able by push-button control to change the brightness from one to 4500 foot-lamberts.

The preliminary results show that large area sources (windows or luminous ceilings) cast a glare at 150 foot-lamberts; for various sizes and conditions it may range between 150 and 300 foot-lamberts.

Since sky brightness, as seen through an ordinary window, is 1500 to 3000 foot-lamberts, these window brightnesses will have to be reduced radically. Eventually, further studies will reveal the effect of turning at an angle to the glare source to find how much the angular orientation changes the glare effect.

The foregoing discussion has related to the discomfort glare resulting from overly bright light sources exposed directly toward the eyes of the student or teacher. The same luminaires or bright windows can cause a serious loss in the visibility of the task by reducing the contrast of the detail against its background.

There is much glare from an overhead lighting unit being reflected in a glossy magazine or glossy printed forms. Sometimes it is so bad that the printing cannot be seen because the reflections "wash out" the detail. Even non-glossy material, such as white or yellow writing pads with blue lines, show up with very bad reflections in pencil writing. The pencil marks themselves pick up reflections of the overhead light source and become lighter. At best the pencil mark is seen as a gray line against its background and the contrast is much less than black characters printed on white material. However, it is still further reduced in contrast by the line getting lighter against an already light background.

Measures Losses of Contrast

These losses of contrast have been measured by J. M. Chorlton and H. F. Davidson in a Toronto classroom under three lighting systems: direct, direct-indirect, and indirect.[13] In each case the light came from three rows of continuous fluorescent equipment. The losses of contrast were appreciable, with the greatest loss from direct, less from direct-indirect, and least from indirect lighting. This study showed that the losses can be reduced by decreasing the concentration of light downward toward the task. The more that light, coming to the task, is spread out over a greater area, the less the contrast loss.

Light coming from beyond 45 degrees with the perpendicular to the task has virtually no deleterious effect. This was demonstrated by D. M. Finch who studied the reflectance characteristics of materials.[14] It would be ideal if light could be eliminated from the zone between the perpendicular and 45 degrees out and all of it could come

(*Continued on Page* 132)

[13]Chorlton, J. M., and Davidson, H. F.: Field Measurements of Loss of Contrast, Illuminating Engineering, 54:482-488 (August) 1959.

[14]Finch, D. M.: Physical Measurements for the Determination of Brightness and Contrast, Illuminating Engineering 54:474-481 (August) 1959.

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Everyone working with audio-visual equipment knows that your best buy is *the best you can buy!* In the case of projection screens, that's Da-Lite . . . a full line of wall-type and tripod models with exclusive features developed over the past 50 years by men who specialize in improved picture projection. See the all-new Da-Lite Jr. Electrol—the finest electrically-operated medium-sized wall screen ever produced. Your Da-Lite A-V dealer will gladly demonstrate!
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New! Dramatic accent colors by Natco. The accent colors shown above are now available in Natco's line of ceramic glazed "Vitritile"—a genuine structural clay tile product. These colors can be used in combination, or can be used with standard "Vitritile" field colors to create interesting, colorful interior wall designs or patterns. The colors are: 1. Accent black, 2. Accent orange, 3. Accent yellow, 4. Accent dark blue, 5. Accent dark green, 6. Accent light blue, 7. Accent light green, 8. Accent brown, 9. Accent red . . . and two Natco Vivid colors, 10. Vivid orange and 11. Vivid red. For further information write for bulletin CC-60.

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Research

(*Continued From Page* 130)

to the task from beyond 45 degrees. (See Fig. 7.)

So far this discussion has dealt largely with efficient seeing. But the most efficient seeing environment can be a cold uninteresting place to live while working. A person is more stimulated and productive if he is pleased with his surroundings and his work becomes a challenge.

Painting an industrial plant to change it from a dingy dark appearance to a bright clean appearance has decreased the accident frequency by 11 per cent. Painting is not enough; an interior can have light finishes which meet the brightness ratios but still have the sterile appearance of a hospital. Some rooms have a "lift;" some are neutral; some are depressing.

Those rooms having a lift are enlivened by the use of color, line and shape. Of course, line and shape, or styling, can add a great deal to the feeling of a room. This would include styling of furniture, pictures, plaques and lighting equipment. More basic, however, is the lift given by color backgrounds and color accent. Regardless of the styling of furniture, and the like, a beautiful color scheme can lift a room from the mundane to a lovely place to study and work.

To get at this problem, the I.E.R.I. sponsored the work of Harry Helson of the University of Texas.[15] Dr. Helson spent many years studying the effects and measurements in the color field. First, he studied the change in appearance of a range of colors as the light source under which they were viewed changed. This study showed that there were marked changes depending upon the source used.

Dr. Helson also studied color preferences. After watching color usage over the years he felt that there is an inherent system of color preferences, not for individual colors but for color combinations. He noted that the interior designer selects certain color backgrounds and then strives to obtain the best colors to go with these backgrounds. Therefore, the final selection is always in terms of color combinations.

What Research Reveals

Research already reveals much about designing the visual environment for optimum seeing and pleasant living. We know the amount of light to put on the visual tasks -- reading, writing and arithmetic, including hectographed, printed and handwritten materials. We know the relation of the brightnesses around the task to the ability to see the task. We know how to limit the brightness of lighting units to eliminate discomfort glare. We know about deleterious reflections in the tasks from overhead lighting equipment and the ways of reducing the real loss of contrast, which is equivalent to throwing away light. We know how to bring pleasing color and color combinations into the interior to make it a lovely place in which to work.

Future research seeks the answer to such questions as: How much light is needed for growing eyes and for various defects? Is there any difference in light needed for quicker and slower students? How much visibility loss is there from looking outdoors and then back at the task? How much glare is there as one faces toward the front of a classroom when the windows are at the side? What practical means can be used to reduce effectively the losses of contrast due to reflections of overhead lighting? How can color be used most effectively in design for stimulating greater livability and motivation values?

Through research in light and vision we all stand on the threshold of an exciting future! ■

[15]Helson, Harry; Judd, Deane B., and Wilson, Martha: Color Rendition With Fluorescent Sources of Illumination, Illuminating Engineering 51:329-346 (April) 1956.

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Research

(*Continued From Page* 84)

ness of the pencil lines is increased to a much greater extent than the brightness of the matted paper background. The increased brightness of the pencil lines causes a reduction in contrast between the pencil and the background, with a consequent reduction in visibility.

Physical Measurements. By using a specially designed microphotometer, Finch measured the actual brightnesses of the printed material and pencil lines and their backgrounds. This was done for different positions of the light sources with respect to the task and observer both in azimuth and altitude. By taking the ratio of the brightness of the task and the illumination, Finch determined a factor characteristic of the material for the particular conditions. He called this factor "brightness factor." For the specific angle of observation, location and size of the incident light source, Finch showed that every non-mirror surface will have its own particular characteristic pattern of brightness factors. This, of course, depends upon the material, texture, spectral absorptance and reflectance, and other intangible qualities usually referred to as sheen or gloss.

Field Studies. Using the same tasks as in the California study, Dr. Chorlton and Dr. Davidson made field studies to determine the loss in contrast, and therefore visibility, under different lighting systems and different levels of illumination. The measurements for each task were made in glare and then in nonglare conditions. Several locations were used for the task in the classroom. The difference between the visibility under the two conditions indicated the loss in visibility due to specular reflectance.

What these studies mean in terms of lighting design may be shown by a comparison with the Blackwell work on illumination. As an example, one of the sample tasks showed that the amount of illumination required under nonglare conditions was 63 foot-candles. With a loss in contrast of 15 per cent, an illumination of 185 foot-candles is needed to have the same visibility as 63 foot-candles under nonglare.

In other words, three times as much illumination was needed to compensate for loss in visibility because of the loss in contrast (within the task detail) from specular reflectance. For instance, if the illumination read on a foot-candle meter in such a classroom were 60 foot-candles, then the child is being asked to work under the equivalent of about 20 foot-candles; 40 foot-candles are thus completely wasted.

A more desirable method of compensating for the loss in contrast within the task (because of specular reflection) would be to improve the *quality* of the illumination. Indirect lighting systems are *more effective* so far as ability to see is concerned.

School administrators, therefore, should evaluate lighting systems in terms of the students' ability to see rather than in terms of mere foot-candle levels of illumination. Lighting equipment manufacturers also have a duty to redesign their general diffuse and direct types of lighting equipment in order to improve the quality of light from such sources.

The nature of the task itself is also of great importance. As contrast within the task is reduced, visibility likewise is reduced. For example, faded hectograph print on white paper is of low contrast and difficult to see. Administrators and teachers should make sure that, whenever possible, visual tasks offer high contrasts. ■

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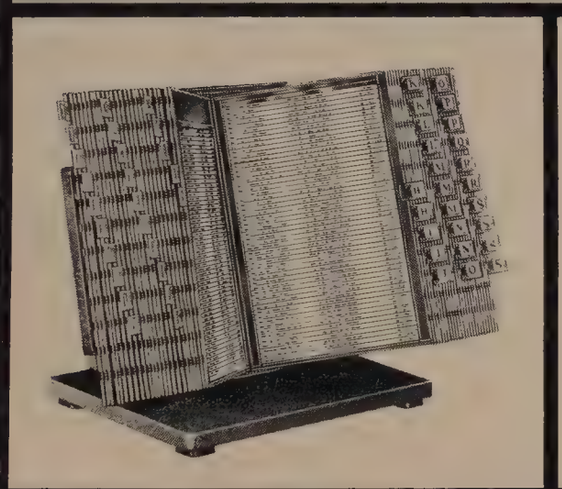

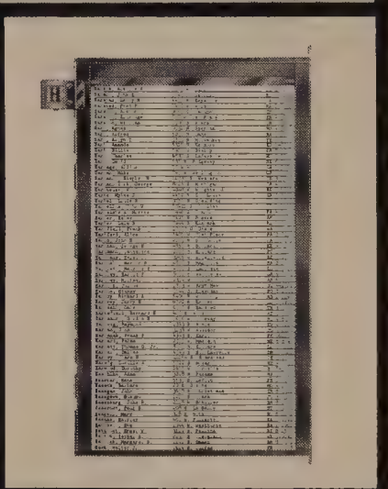

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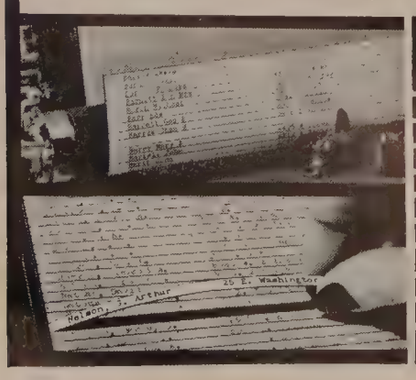

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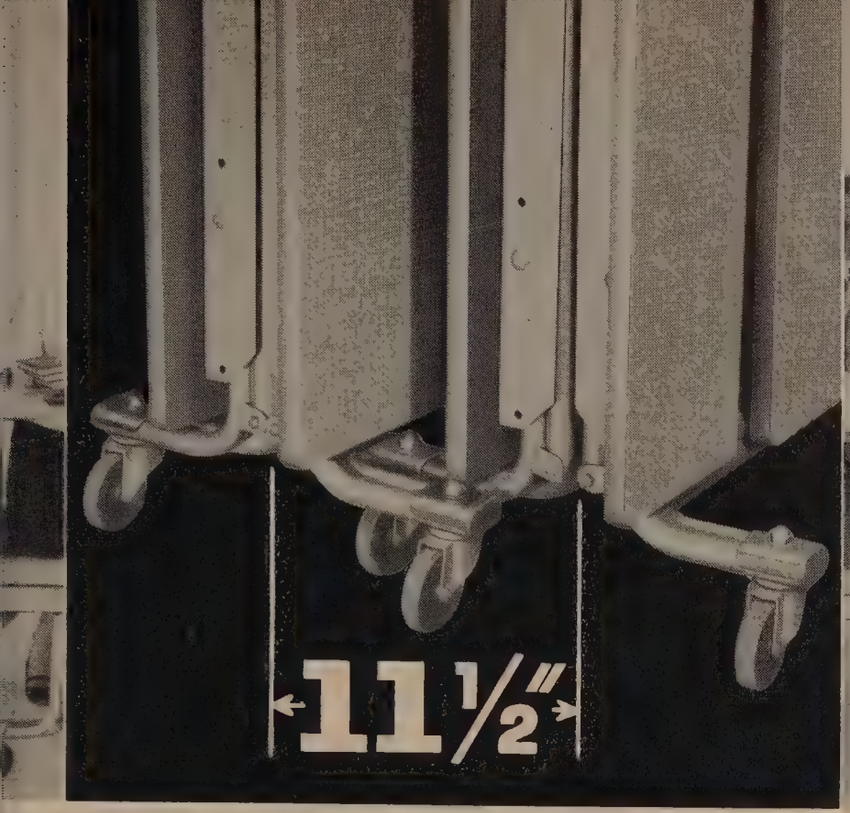
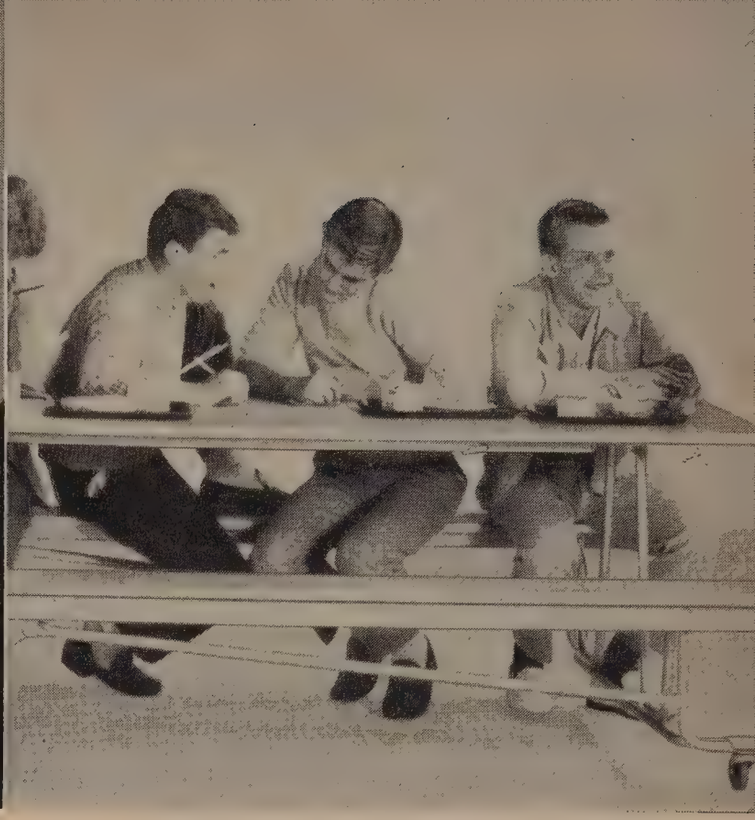
Knoxville Grade-a-Year Plan of Integration Is Challenged

KNOXVILLE, TENN. — The school board here has filed a grade-a-year desegregation plan with the federal court. Attorneys representing 17 Negroes seeking admission to white schools have challenged the plan.





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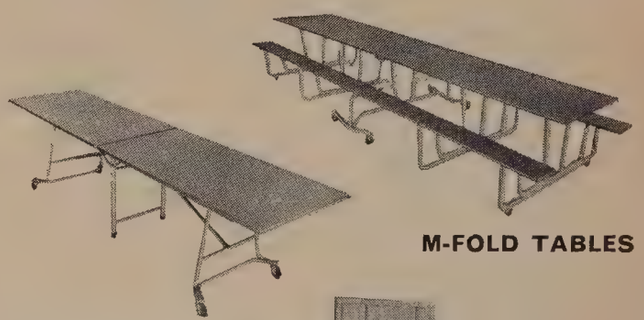

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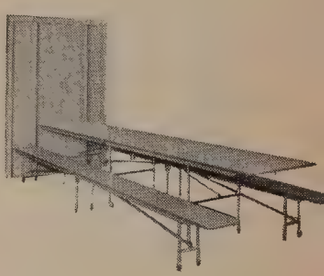

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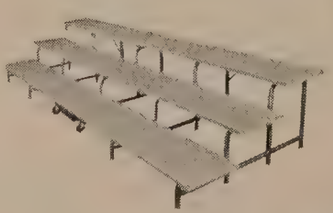

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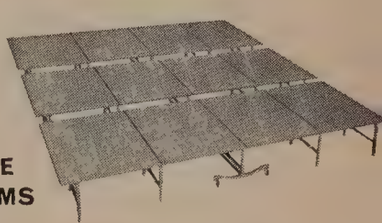

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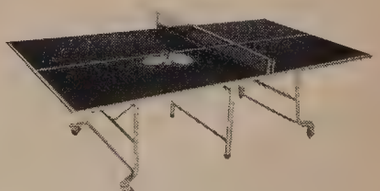

TENNIS TABLES

NEWS IN REVIEW

Audio-Visual Convention Lauds 'Instructional Technology'; Reviews History, Predicts Growth

CHICAGO. — "Shortening the distance between the learner and the things to be learned" was the theme of the 20th annual national convention and exhibit of the National Audio-Visual Association here August 6 to 9.

Center of attraction was a display of more than $1 million of the latest audio-visual equipment and materials. The 203 booths of 151 exhibitors, covering one-half mile of space on three hotel floors, demonstrated the tremendous technological advance made by science and industry to improve classroom teaching technics. Most spectacular among the fascinating array of teaching tools were comparative newcomers to the field, namely, tape recorders, language laboratory equipment (some with transistor remote controls that carry the audio impulse from transmitter to desk receiving headphones without any wire connection), and automated teaching machines.

Many school people were among the approximate 3000 registrants from all fields of audio-visual utilization who attended the convention. Meeting concurrently with N.A.V.A. on two days were the first National Audio-Visual Education Forum and the TV seminar committee and board of directors of the N.E.A. Department of Audio-Visual Instruction.

Maj. Gen. J. B. Medaris, ex-army missile boss, told N.A.V.A. members:

"I decry the practice of unloading meaningless gadgetry on educators and classroom teachers simply to make an immediate profit. Inevitably, the audio-visual field and everyone else suffers."

(*Continued on Page* 138)

New York Increases Use of Electronic Teaching Devices

NEW YORK. — Electronic foreign language laboratories will be installed in 27 high schools, seven junior high schools, and four elementary schools here this month. Only one high school previously had the equipment.

To prepare for classes using the laboratories, 30 secondary French teachers participated in a workshop this summer at Columbia University. Other courses were offered this spring by Columbia and the board's bureau of audio-visual instruction. The board also has issued a curriculum guide on language laboratory technics.

The laboratories are partially financed under the National Defense Education Act.

A.S.B.O. Annual Meeting To Observe Golden Anniversary

Derthick

ST. LOUIS. — Three "E's" of school business — education, economics and ethics — will provide the theme for the 46th annual meeting of the Association of School Business Officials of the United States and Canada. The program, to be held here October 9 to 13, will be marked by special activities in observance of the organization's 50th anniversary. A.S.B.O. was founded May 16, 1910.

Keynote speaker at the first general session on Monday morning will be Lawrence G. Derthick, U. S. Commissioner of Education. Speaker at the Tuesday morning session will be John Morley, recent winner of the "Speaker's Oscar" from the International Platform Association. John Furbay, representing General Motors Corporation, will address members on Wednesday. Discussion meetings will be held Monday through Wednesday, and the usual "clinic" is planned for Tuesday evening.

A four-part golden anniversary banquet will be held on the final evening. President G. Alvin Wilson will serve as toastmaster and as speaker during the second part of the program. Finally, a Jack Martin production of "Showboat" will be followed by dancing.

In observance of the anniversary year, A.S.B.O. plans to publish a history of the association, compiled by Wesley L. Brown, assistant superintendent, New Trier Township High School, Winnetka, Ill. "The School Business Administrator," which sets forth the qualifications and responsibilities of the official in the school business field, will be distributed at the opening of the convention.

The theme of the 200 unit annual educational exhibit will be, "The Professional Way Is the Best Way."

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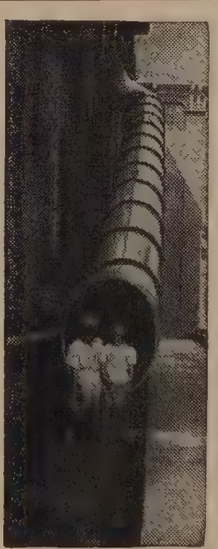

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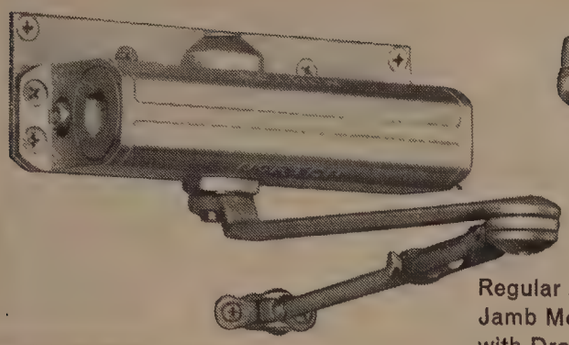
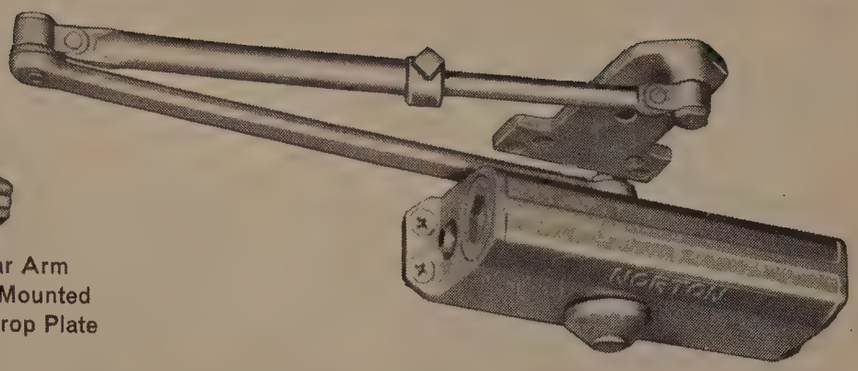


Regular Arm
Jamb Mounted
with Drop Plate



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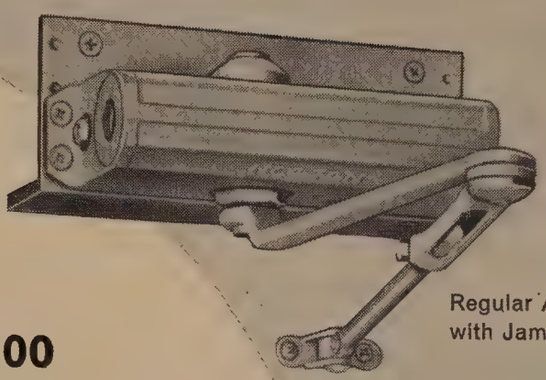
new Trimline Series 1500 offers versatility



Regular Arm
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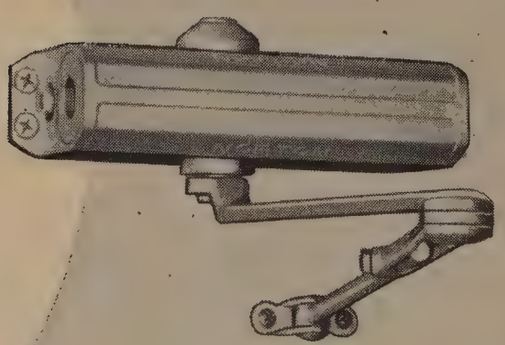
Norton's New Series 1500 Trimline closer is designed and built to provide greatest possible versatility, design harmony, and dependability in door closers.

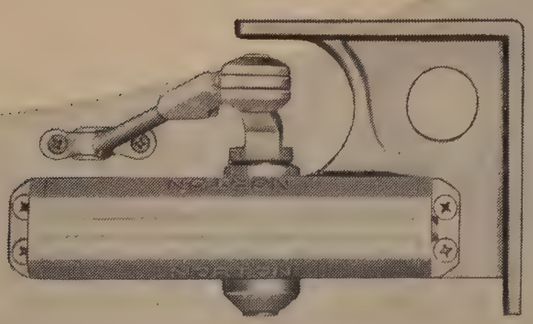
The versatility of this non-handed rack and pinion door closer allows maximum freedom in your choice of door and frame style and closer application. The Norton Series 1500 TRIMLINE closer affords dependable, trouble-free control of a wide range of door types—wood or metal, interior or exterior.



Regular Arm
Top Jamb Mounting

Regular Arm

1010



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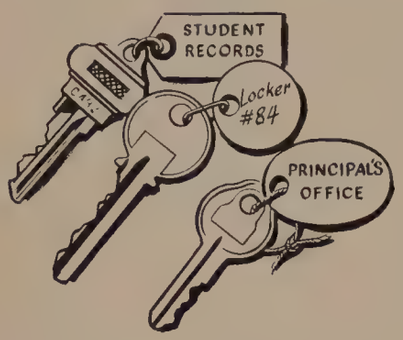

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GLEN RIDDLE PENNSYLVANIA

(*Continued From Page* 136)

Stating that "the application of technology to the teaching process holds tremendous promise for increasing the productivity of education," Gen. Medaris outlined the usefulness in time saving and increased efficiency of modern teaching devices. He also stressed the role of teaching devices to help implant desirable knowledge in the student's mind and teach him, by demonstration and precept, to bring that knowledge to bear on the problems of today.

A spokesman for the industry suggested that achievement of this ideal awaits the "complete wedding of the creative genius of electronic technology with the skills and creativity of the classroom teacher."

Automated Tutors. Those who attended the forum were told that because teaching machines, strictly speaking, do not fit into the category traditionally known as audio-visual, some people in the audio-visual field have been inclined to stand back to see what would happen. Discussion supported the view that audio-visual people should acquaint themselves thoroughly with the uses and limitations of this device, since the audio-visual department of schools is certain to inherit this machine and the programing for it. As teaching machines become more sophisticated, they will increasingly become visual. Each tool of instructional technology fills a certain niche where it can render a worth-while service. Just what this niche is should be determined as quickly as possible by the audio-visual specialist.

Report on N.D.E.A. Seerley Reid of the U.S. Office of Education reviewed the status of the National Defense Education Act of 1958, pointing out that it had only two more years to go. It is emergency legislation and should not go on forever. Will the emergency have passed by 1962? he asked. Various speakers stated that while good progress has been made with the aid of federal funds, the surface hardly has been scratched when compared to the need. Perhaps one of the most important developments in the contemporary education field has been the channeling of N.D.E.A. funds into the purchase of school instructional and audio-visual materials.

Keynote Substitute. For the usual keynote address "The Challenge of the Sixties" was presented. With the aid of slide projectors, tape recordings, and a wide screen, the 30 year history of the industry was reviewed. Also included were recorded interviews with prominent leaders.

Among those quoted were Anna L. Hyer, executive secretary of the department of audio-visual instruction, N.E.A. Miss Hyer noted five trends in audio-visual education among the nation's schools:

1. Fast growth in auto-instructional materials, devices and technics.

2. A decided increase in the use of educational television, in filmed series, and in the utilization of equipment tailored for communication through large groups.

3. Interest in instructional systems: the planned integration of content, instructional resources, and methods of presentation.

4. Rapid expansion of local production of materials with more simplified and less expensive equipment for recording TV programs, making transparencies, and the like.

5. A speeding up of the rate of acceptance of instructional technology.

"By the end of the sixties, I believe, instructional technology will be an accepted fact of life; it is our challenge of this decade to make this so," Miss Hyer stated.

Facts and Figures. The audio-visual field in the United States represents an investment in excess of $2.5 billion since World War II. Annual dollar volume for 1959 was estimated at $287 million, up 12 per cent from 1958; it is expected to pass $300 million in 1960.

Film production of educational titles during 1959 was up 20 per cent, compared with a gain of 16 per cent for the industry.

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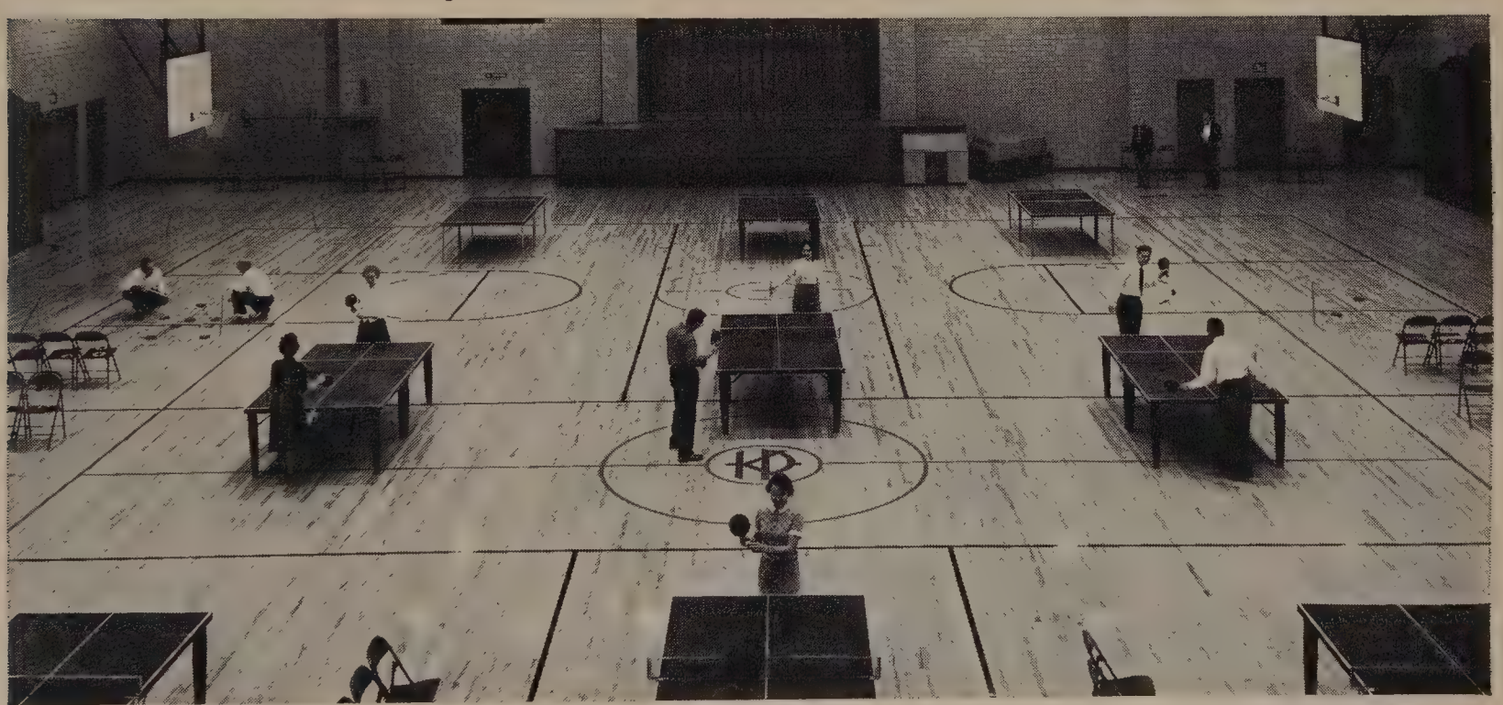

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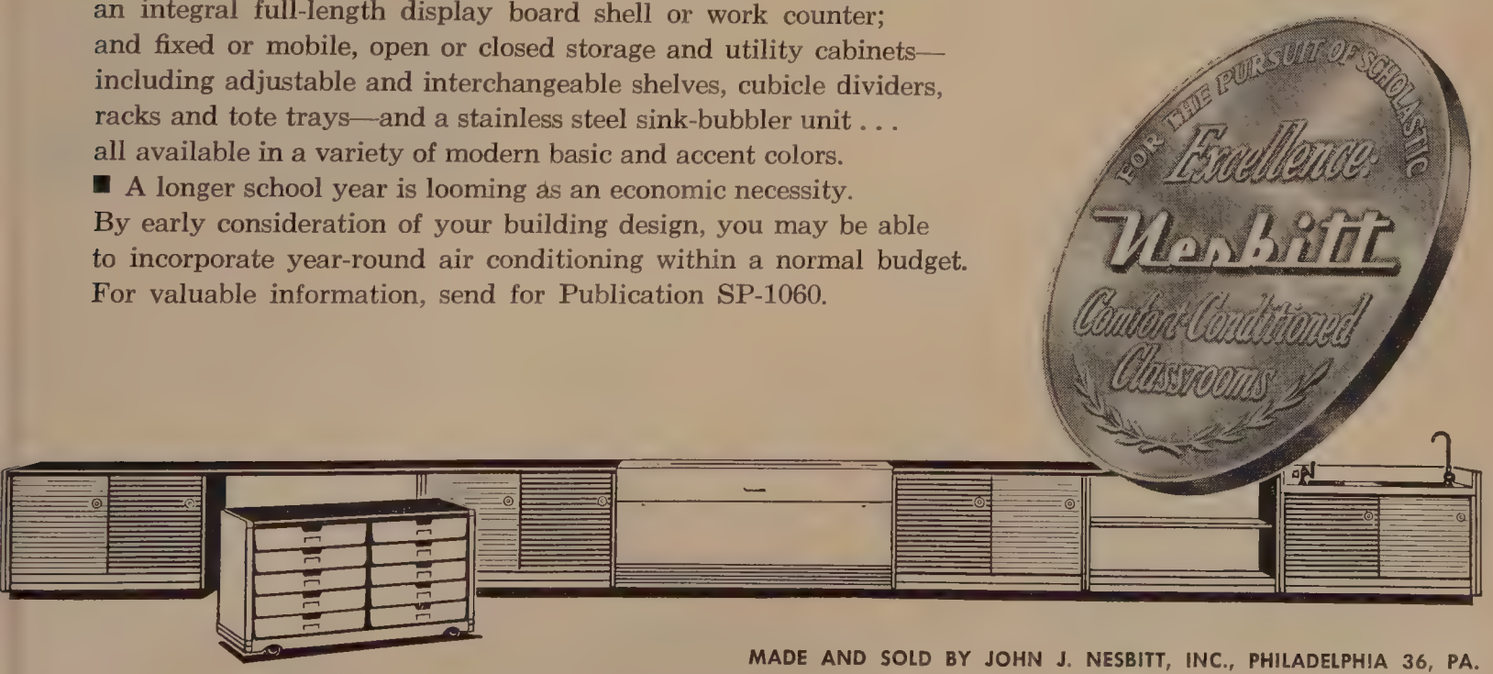

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National Safety Council To Convene Next Month

CHICAGO. — About 700 school and college administrators, supervisors and teachers are expected to participate in the 48th National Safety Congress here October 17 to 21.

Representing schools in the United States, Canada and several foreign countries, delegates will consider such subjects as safe school buildings, safety construction, safety problems created by changing curriculums, and the quality of driver education.

Other sessions will be devoted to home, traffic, farm, transit and industrial safety.

Westport Adopts Program of Teacher Evaluation

WESTPORT, CONN. — Teachers here will evaluate themselves on professional competence, parent relations, and professional and staff relations beginning this month, the board of education has announced.

Regular teachers will be evaluated by their fellows not less than once every two years, probationary teachers at least once annually prior to January 15.

The program will be reviewed at the end of the 1960-61 school year to determine continued use.

Rural Educators To Gather in Louisville in October

LOUISVILLE, KY. — Shifting scenes in rural education will be viewed philosophically and practically by those who attend the successive conferences here of the N.E.A.'s Department of Rural Education October 7 and 8 and the County and Rural Area Superintendents October 9 to 12.

Program topics center largely on the question: In what ways, if any, should the schools serving rural and small communities modify their programs or offer new services because of the rapid changes and the complexity of the world today?

Presidents of the two associations, W. E. Bishop of Colorado and Winston Brown of Wisconsin, jointly refer to the October conferences as "a source of continuing strength in developing the programs that today's rural and small town schools need and want."

Clifford Archer of San Diego County, California, president-elect, will be succeeded in the rural education post by J. C. Fitzgerald of Oklahoma. T. C. Knapp of Stark County, Canton, Ohio, is the newly named president-elect of the county and rural superintendents to succeed Cecil Hardesty when he takes over as president.

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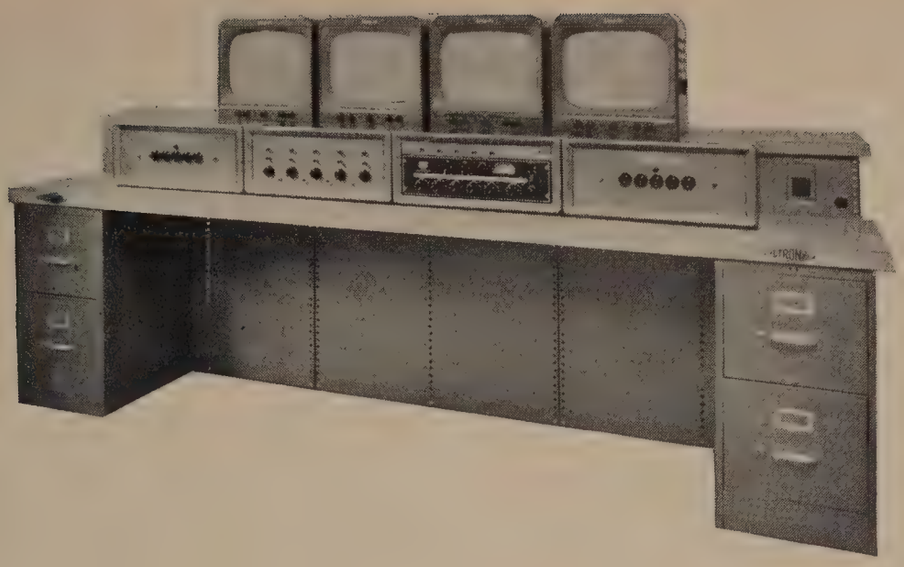

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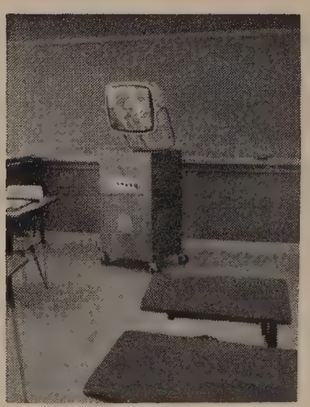

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F.C.C. permits for an open-circuit television system in your district should be readily available.

The Richardson, Texas school district is one already employing on-the-air television at a cost comparable to one classroom. You may find this system best for your district, too. For more information about how your district, even your entire community, could utilize *open*-circuit television for classroom broadcasting, please contact

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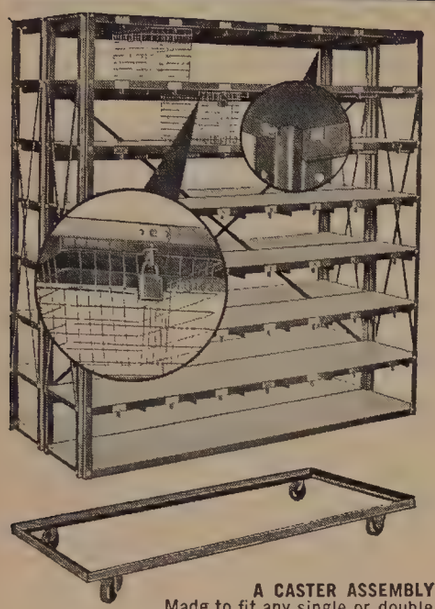

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Urges Collaboration on New Education Standards

STANFORD, CALIF. — "Education's leadership must listen more readily to the college educated public (with or without degree)," Fred Hechinger, education editor of the *New York Times,* said here recently at the annual Cubberley Conference on Education at Stanford University.

In his address on "The High School and the American Public," Mr. Hechinger stated that the crackpot "taxpayer's representative" who complains that the schools aren't what they used to be is quite different as a public influence from the novelist who thinks that he can point out flaws in the English curriculum. It is sheer folly, he said, to embrace or reject both with equal vehemence.

The editor maintains that the public has a right and responsibility to prevent the profession from "feather bedding and establishing phony standards." Demanding a college degree for teachers of driver education on the same level with teachers of English is a matter for public censure, whatever educational spokesmen might say, said Mr. Hechinger.

Education needs the full cooperation of experts in many fields, he continued, but it must be clear that none of them will be permitted to "take over."

The hope for the future, he believes, is that the best minds among the public and the best minds in the profession will collaborate to set new standards.

Margaret Mead, anthropologist, spoke about "The High School of the Future" at the conference. She said that education must now be seen as a lifelong affair, to be distributed over a whole lifetime instead of over only the first fifth or quarter of a lifetime.

With this view, Dr. Mead declared that leaving school entirely for some other sort of experience would not be a fatal handicap, but possibly a considerable experiential asset. Good students of 40 would be preferred to indifferent students at 15.

Junior College To Train in Food Service Administration

CHICAGO. — A new two-year program in food service administration will be offered this fall for the first time by the Chicago City Junior College.

The new program consists of 31 semester hours of specialized courses leading to the associate of arts degree. The courses include training and study in the field of nutrition, diet modification, sanitation and hygiene, cycle menu planning, personnel practices, job analysis, work simplification, equipment layout, and special field trips.

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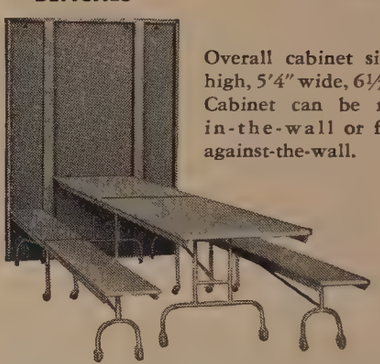

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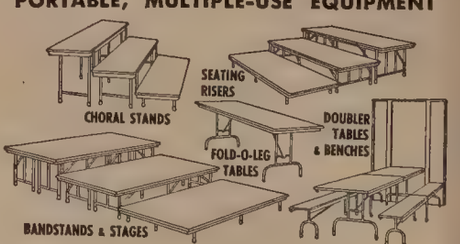

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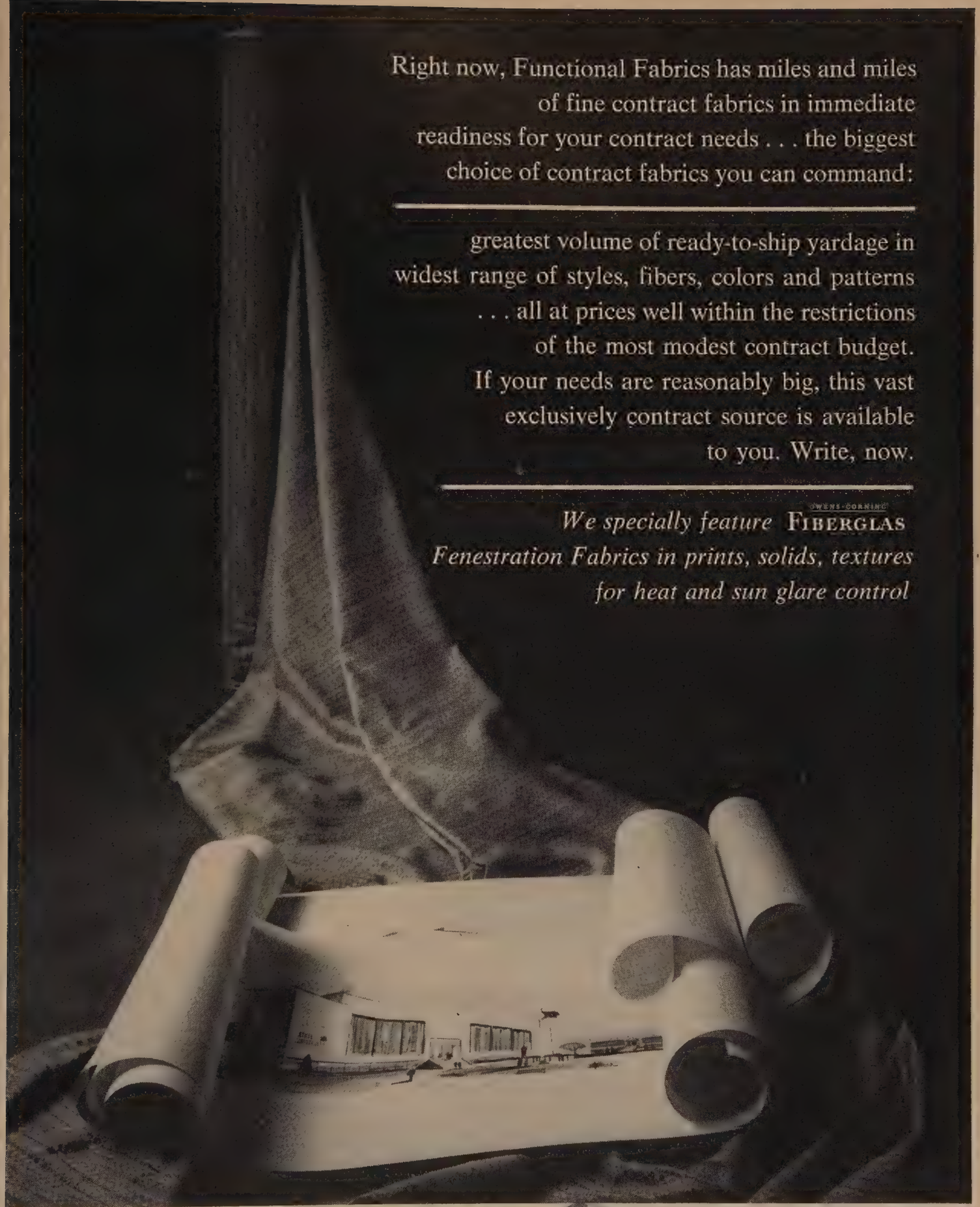

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Demonstration Class Studies Mathematics by Machine; Experiment Shows Learning Time Cut in Half

ROANOKE, VA. — An experiment in learning mathematics by using teaching machines at the secondary level will begin this fall in the public schools here. The project, being developed through a grant from Encyclopaedia Britannica Films, Inc., will cover high school algebra, plane and solid geometry, and trigonometry. The work is being carried on in cooperation with Hollins College.

In anticipation of the more extensive studies, a demonstration class was organized during the second semester of the 1959-60 school term at Woodrow Wilson Junior High School. In view of the limitations of this experiment, those in charge consider the findings suggestive, rather than conclusive.

The demonstration class of 34 eighth graders (a cross section selected from a class of 180 after eliminating 60 students who were previously designated as having above average ability in mathematics) was able to cover an entire year of ninth grade algebra in approximately one semester. Forty-one per cent of these students surpassed the average score made by ninth graders on a national normed test.

The material was programed by Daniel P. Murphy, a former high school mathematics teacher who is now enrolled in the graduate program of psychology at Hollins College. Allen D. Calvin, associate professor of psychology at Hollins, was in charge of the project.

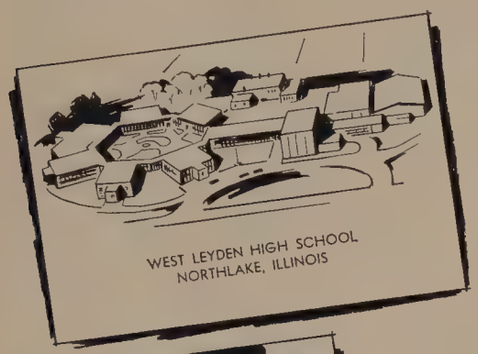
The programed material was given to the 34 eighth graders without any preliminary testing with a pilot group of students, because of the necessity to keep up with this demonstration class. To the surprise of those in charge, the students were able to move so rapidly that the material could not be programed quickly enough to keep them supplied. A. B. Camper, Roanoke's director of instruction, believes that if the material had been made available more promptly, many of the students would have finished the course earlier.

The subject matter normally covered in the ninth grade was taught without the aid of a teacher, textbook or homework; the only source of knowledge was the material on alegebra in the teaching machines. However, the teacher did serve as an important factor in maintaining student morale.

The national normed test has five categories ranging from "very low" to "very high." The test is based on the performance of ninth grade students. On this test the average score of the eighth grade demonstration class fell in the lower end of the "average" category for ninth graders, disregarding mental age. Only one fell in the "very low" category.

When the students were asked whether they would prefer the teaching machine alone, the teaching machine with the teacher's help, or the teacher only as in a conventional class, only 16 per cent expressed a desire to return to a conventional classroom situation. Asked what would be their preference if this program were improved, 25 per cent of the students said they would prefer the machine alone, 69 per cent said they would prefer the machine plus the teacher, and only 6 per cent indicated a preference for the conventional classroom situation.

It would appear that when properly tested programs for teaching machines are placed in the hands of teachers, there will be a major break-through in the high school teaching of mathematics, according to Supt. E. W. Rushton. He believes, however, that the results from the Roanoke study should be thought of only as tentative. The impact of the "novelty" effect, whether the size of the sample was large enough, and whether the findings would hold up in other school systems, remain to be determined.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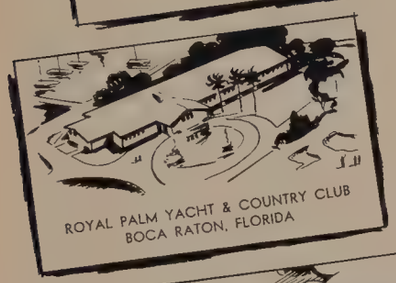
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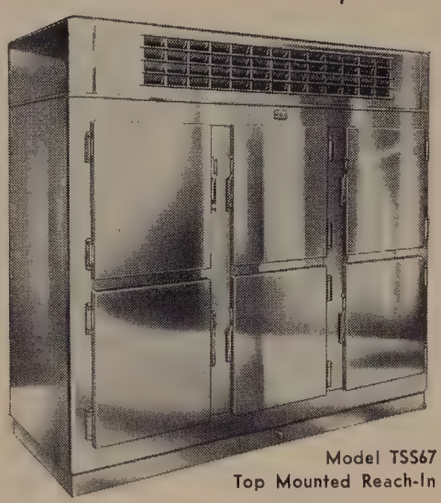
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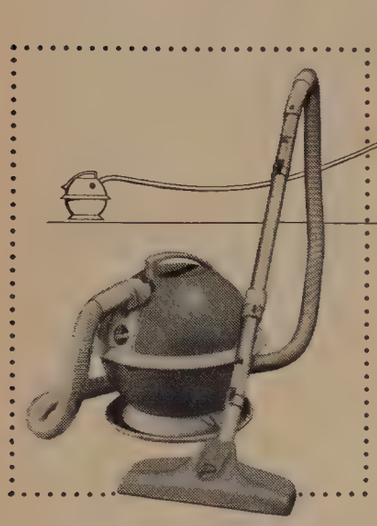

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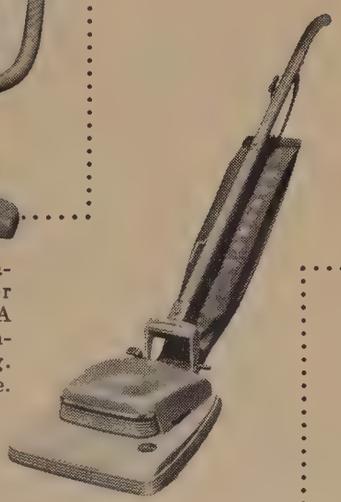

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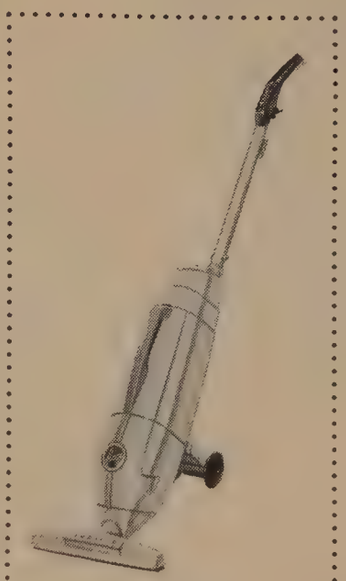

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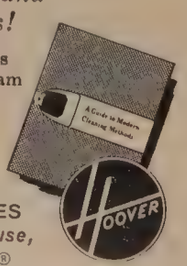

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N.A.S.D.T.E.C. and A.A.A.S. Jointly Study Certification

WASHINGTON, D.C. — Improvement of teaching through the improvement of teachers is the goal of a program that is being financed by the Carnegie Corporation. The program, now entering its second phase, aims to provide assistance to state directors of certification in carrying out their responsibilities.

Initially, the study is concentrating on the teaching of science and mathematics.

Joining forces on the project are the National Association of State Directors of Teacher Education and Certification and the American Association for the Advancement of Science.

Currently states are reviewing recommendations developed at various regional meetings and workshops held since the initiation of the program in October 1959, and approved at the annual meeting of the N.A.S.D.T.E.C. in San Diego, Calif., last June.

Following the state level evaluation there is to be an invitational national conference. Final recommendations will then be made at the June 1961 meeting of the association.

More specifically, attempts are being made during the study to:

1. Prepare guides for program approval by state directors.
2. Reach common agreements regarding qualitative factors in the preparation and certification of teachers of science and mathematics.
3. Identify the areas of instruction in these fields for which programs and guide lines must be prepared.
4. Provide continuity in teacher education beyond the baccalaureate degree to support a national plan of reciprocity among states.
5. Discover a process whereby representatives of organizations and state certification and accreditation officials may work together in the development of a teacher education program.

The original plan for this study, drafted by an advisory board in 1959, was revised at regional meetings held this year in Denver; Washington, D.C.; Chicago; Reno, Nev.; Louisville, Ky.; Oklahoma City, and Boston, and at four regional conferences held in Chicago, Salt Lake City, Atlanta, and New York.

Some 170 participants included at least one officer of a regional accrediting agency and classroom teachers, supervisors and administrators from local school systems, state education department personnel, persons from science and teacher education faculties, and administrators of institutions of higher education.

John R. Mayor is director and William P. Viall is associate director of the study.

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Board Policy Criticized by State Study Group

PEEKSKILL, N.Y. — The school board here has been reprimanded by the state department of education for direct administration over school employes instead of administration through the superintendent.

When Supt. Herbert B. Smith was suspended, then reinstated by order of the state commissioner of education, the board suspended him again.

After an investigation at the superintendent's request, a state survey team ruled that "the board of education has for many years followed practices by way of board organization and function and by way of relationship to the superintendent and three members of the staff that make for conflict and inefficiency."

The report said that this plan of operation is "administratively unsound" and that it makes it "difficult, if not impossible, for a superintendent of schools to function in a leadership capacity."

The board has agreed to continue Dr. Smith's contract.

Church Committee Disfavors Direct Loans to Schools

NEW YORK. — Federal loans to sectarian institutions amount to support of the institution's program, charged the Rev. G. Emanuel Carlson at a meeting here of a committee of the National Council of Churches.

"For instance, if I'm training Baptist students to become ministers and the government puts money in my lap, then I'd be administering those loans to meet my own purposes, not the government's setting them up," he said.

Dr. Carlson preferred that loans under the National Defense Education Act be made to students through the state departments of education. Then the money would not be "subject to any misinterpretation" by institutions.

Will Hold Sessions on School Food Service

PHILADELPHIA. — Approval of certification requirements for school lunch managers and supervisors by the State Council of Education will be the basis for discussions at a meeting of administrators, managers and supervisors here October 13.

The southeastern chapter of the Pennsylvania School Food Service Association in conjunction with the University of Pennsylvania Schoolmen's Week has planned another program for school food service personnel to be held at Drexel Hill, Pa., October 14.

Number one in a series

Vendo report on
Milk Vending
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In Central High School at North York, Pa., five Vendo Milk Merchants and four Vendo Ice Cream Merchants, operated by Rutter Bros. Dairy, Inc. of York, serve 1300 students. On the average, these machines vend 2000 units of white milk and 10,000 units of chocolate milk, plus 13,500 ice cream items every month. This is in addition to cafeteria sales.

You can see for yourself what a tremendous service these Vendo machines perform. They store, refrigerate, display, serve and even make change. Supplying large student bodies such as this Pennsylvania school with healthful, refreshing milk and ice cream is effortless for school personnel when Vendo Milk and Ice Cream Merchants are installed. Write today for details.

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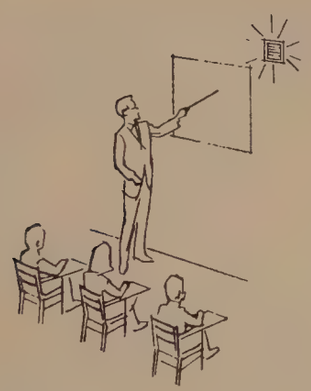
8 ways to enrich school curricula and improve administration

. . . through an economical sound-communication system

The console shown here is the central control of an Executone sound-communication system for an average-sized K-8 or secondary school. Located in the General Office, it handles switching, programming, transmission and power amplification for all the services described below—and others that your special requirements may suggest. Its 5-channel capacity eliminates the need for more than a single conduit for signals or communication between any two points in the system. Identical functions are available in a vertical console, for use where office space is at a premium.

Supplement the teaching program with sound



Classroom audio-aids can give students access to sources of important teaching materials . . . can place each class in closer relation to the school and the world around it . . . can help develop each pupil's critical faculties. Leading educators value the availability of:

Radio broadcasts: speeches; music; coverage of special events; interviews; important dramatic presentations; sessions of Congress; etc.

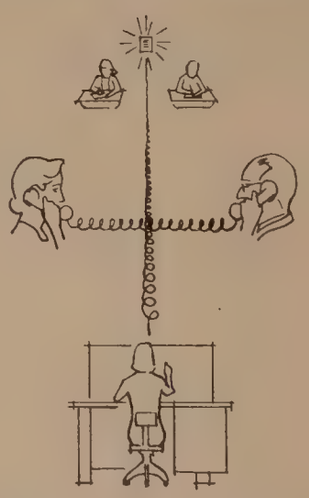
Recordings: from an ever-increasing fund of educational material on tape and discs.

Transmissions from other parts of the school: student musical programs; sports events; etc.

Recording and play-back facilities: for classes in choral and instrumental music; language and speech courses; drama workshops; etc.

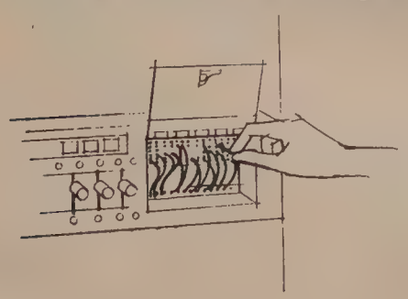
All these audio-aids can be supplied by a single Executone classroom reproducer . . . the same instrument that handles time signal, alarm and intercom functions. With a standard Executone system, any combination of rooms—chosen by selector-switches—can receive either of two simultaneous sound transmissions. Reproduction is of unusually high quality. Where recording and play-back are desired, rooms need only be supplied with microphone and tape-deck jacks. Amplification takes place at the main control console.

Speed administrative action: relieve over-burdened staff



Freedom to teach—and to work more productively—is one of the best answers to the chronic shortage of teachers and administrative personnel. Time savings increase in direct proportion to the staff's communication capabilities. Today, these can economically include: A) 2-way electronic voice intercom . . . between the office and any classroom . . . with complete privacy safeguards. B) Private-line room-to-office and room-to-room intercom . . . with call origination from any point. The Executone system offers all the above, providing 2-way remote-reply intercom through each classroom speaker . . . optional private-line handset communication using an independent channel carried by the same wiring.

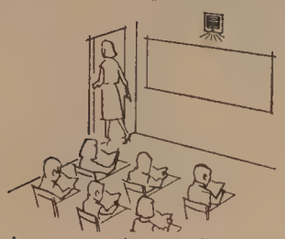
Save money & space in providing variable time programs



Classes with varying time requirements need no longer be subject to an inflexible set of signals. But conventional time-programming equipment—including independent crossconnect panels, relay racks, classroom buzzers and wiring systems—is bulky and expensive.

The Executone system includes a remarkably compact, easily accessible peg-board programmer—which allows each classroom to be placed on any one of six different time programs within seconds. This function is built directly into either standard console! The costly conventional system is eliminated.

Preserve student discipline during unsupervised intervals



When teachers must leave their classes, the maintenance of discipline usually depends on the presence of a substitute. Faculty members may now be relieved of this non-productive extra duty. Unattended students can be monitored from the Office—through the Executone speaker—and notified by its open-line signal light that they are under remote supervision.

Control student transportation

Teachers find it especially difficult to keep order—and prevent delays—when restless students must await loadings of homeward-bound school buses. This condition is relieved when children are permitted to play freely—until summoned to the loading area in proper groups and directed to their buses.

This can be achieved through an inexpensive adjunct to the Executone system: a microphone jack at the loading area and speakers at loading and congregation areas. Both microphone and speaker wiring run in the same conduit. The amplifiers at the main console are utilized. Any available microphone can be plugged in at dismissal time.

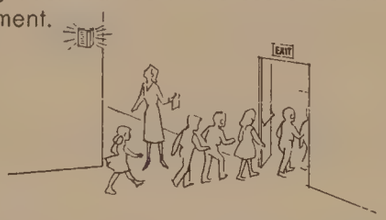
Preserve the continuity of classroom activities

Communications in the modern school go a long way toward assuring uninterrupted class activities. But care must be taken that the facilities which make this possible are not themselves a disruptive influence. This is the case where calls make it necessary for teachers to drop what they are doing, to approach or handle equipment . . . or where a call interrupts a sound transmission.

Executone removes both of these contingencies. Through-the-speaker calls, for brief conversations, can be answered by the teacher from any point in the room—without raising her voice. And use of the optional handset channel for longer conversation prevents interference with concurrent sound programs.

Prevent confusion and panic in emergencies

Leading administrators have long felt the need for greater control of student bodies in emergencies. They seek alarm signal facilities to augment standard fire alarm systems—for such special contingencies as air raids. To control student movements in critical situations, they wish to make it possible for any staff member to broadcast voice instructions—without having been trained in the use of sound equipment.



In the Executone system, the same components used to produce time signals will also provide supplemental alarms. Executone furnishes duplicate signal generators—for fail-safe standby duty. For follow-up voice instructions, after an alarm, a staff member need only touch the 'emergency' bar at the Executone console. This overrides all other transmissions . . . allows him to speak immediately to the entire student body.

Provide quality-controlled sound for audience activities

No audience facilities are so intensively used as those in the modern school. Auditoriums and gyms serve not only during the school day—but also for adult and community activities . . . for socials and special events. Sound reinforcement equipment must be designed to high standards. And controls must be efficient. Conventional microphone mixing units—because of A-C power, ventilation and space needs can seldom be situated where they do most good.

An Executone system provides not only sound reproduction of highest quality, but also new flexibility in the location of controls. Transistorized preamplifiers and mixers are compact enough for concealment anywhere . . . have no special installation requirements.

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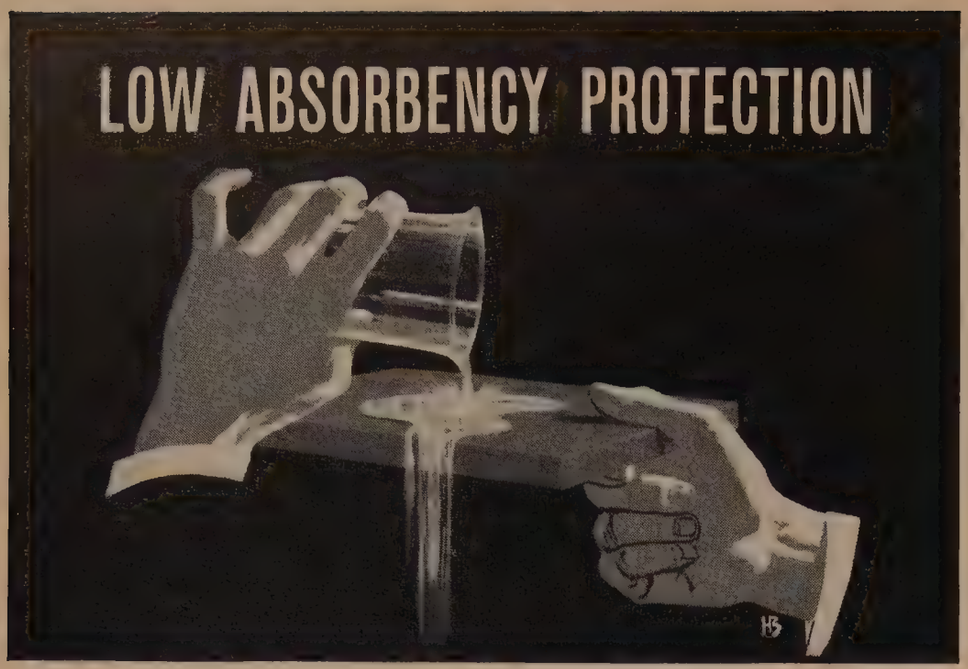

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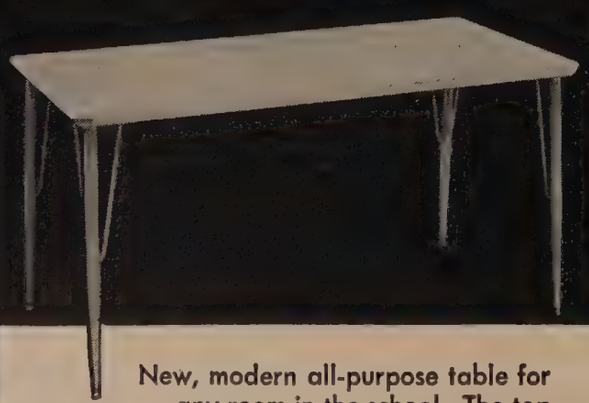

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Will Use New Alphabet for Teaching Reading

LONDON. — The Roman alphabet has been enlarged for use in an experiment to teach children how to read. Planned by the University of London Institute of Education in cooperation with the National Foundation for Educational Research in England and Wales, the experiment will be conducted with five-year-olds to seven-year-olds.

The alphabet has 19 new characters, most of them being combinations of two letters. Capitals have been eliminated as well as the letters c, q and x.

The results of a study of reading ability made by Joyce M. Morris, officer responsible for reading research, University of London Institute of Education, prompted the project. Said Professor Morris: "We found that one out of five children could not read after two years of schooling. One out of every four were not up to standard. Thus almost half were poorly equipped to start lessons in the junior school."

Critics of the project contend that the transfer to the regular alphabet will be difficult for children.

"In learning anything, if we can get an early sense of mastery in learning a simplified form we can make an easy transfer later to the more difficult forms we may meet in practice," says H. L. Elvin, director of the institute and a member of the seven-member committee guiding the experiment.

Primers and storybooks in the new alphabet will be written during the next 15 months before the experiment begins with 1200 children in 1961. The results of teaching by the new method and by conventional forms are to be compared.

A.L.A. and C.L.A. Hold First Joint Conference

MONTREAL, QUE. — Frances Lander Spain, coordinator of children's services, New York public library, was installed as president of the American Library Association at the first joint conference of the A.L.A. and the Canadian Library Association held here recently.

The conference theme of "Breaking Barriers" can be forwarded by the library's role of encouraging openness of attitude, intellectual curiosity, desire for enlightenment by speeding the exchange of ideas and flow of knowledge in the community, believes Mrs. Spain.

Neal Harlow, chief librarian of the University of British Columbia, Vancouver, was installed as president of the C.L.A. He reminded some 4500 participants that libraries are a link between the old and the new and possess a unique faculty both for conservation and for change making advances possible for every generation.

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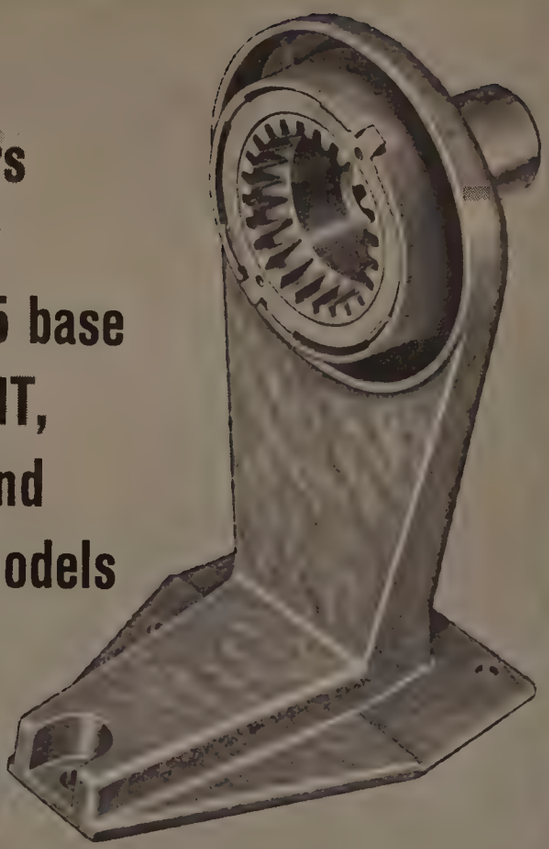

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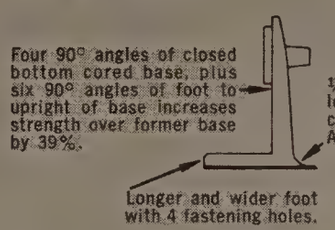
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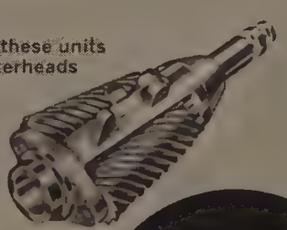

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Circular Lists 50 State Legal Provisions for Transportation

WASHINGTON, D.C. — Authority to provide transportation for children attending nonpublic schools is indicated in the laws of 19 states.

This is one of the highlights in the 1960 revision of State Provisions for Transporting Pupils. The U.S. Office of Education publication (Circular No. 453) was prepared by E. Glenn Featherston, assistant commissioner and director of the division of state and local school systems, and John B. Murray, specialist in pupil transportation.

In three tables, the 16 page circular sets forth the various provisions of the 50 states for transportation to and from school, for special groups, and for curricular and extracurricular purposes.

Among other findings highlighted by the statistics are the following:

Legal authorization to transport pupils for curricular and extracurricular purposes is indicated in 21 states. In most of the remaining states, although not specifically mentioned in law, this service is a general practice.

The legal basis for providing pupil transportation in most states rests not in a single law, but in a number of permissive and mandatory statutory provisions.

Specific legal provisions exist in most states for the transportation of the handicapped, but several states still have no such provisions. Other groups for which states less frequently make transportation available are pupils attending private schools, teachers and other employed personnel.

In recent years it has become common practice to utilize public funds to transport pupils to points away from the school building for instructional purposes and to extracurricular activities. Almost one-half of the states now authorize such service by law, and the practice is fairly common in the remaining states.

Grants $2.3 Million for Training College Teachers

NEW YORK. — To help improve the preparation of college teachers the Ford Foundation has granted $2,355,000 to 14 universities.

The grants are to support a new concentrated effort to help strengthen the master's degree as a sound qualifying degree for college teaching. The rapid expansion of college faculties is making the master's degree the predominant level of preparation of most newly employed college teachers, the foundation said.

Another $561,000 will go into programs at three universities for the preparation of elementary and secondary school teachers.

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GJ 500 series CONCEALED (or surface mounted) OVERHEAD DOOR HOLDERS." (Most efficient shock absorbing device for holding door open at any specified degree up to 110°. Resilient spring cushion absorbs force of violent openings. Holds door conveniently open for continuous "through" traffic. Overhead, they present no stumbling hazard, are tamper-proof and cannot interfere with cleaning.)

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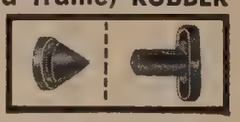

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Sinclair Lane Elem. School, Baltimore, Maryland. Edward J. Hofstetter — architect

Algonquin School, Des Plaines, Illinois. Childs and Smith, Chicago, Ill. — architects

Wellesley Senior High School Addition, Wellesley, Mass. Perry Shaw Hepburn & Dean, Boston, Mass. — architects

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New York City Schools To Close on Jewish Holidays

NEW YORK. — For the first time, beginning with Rosh ha-Shanah on September 22 and 23, the New York city schools will be closed on Jewish holidays.

The motivating factor behind Supt. John J. Theobald's recommendation to the board, which was accepted April 26, is not the high Jewish school population but the large number of teachers who do not work on the high holidays.

"I cannot take the responsibility for the safety and well-being of school children when I have only a handful of teachers to watch over them," Dr. Theobald told the board.

Claim Lay Readers of Themes Help Improve Writing Quality

COLUMBUS, GA. — The quality of themes written by high school students here has improved with the employment of lay readers, claim teachers who participated in a lay reader program last year.

This was accomplished because teachers were able to assign a greater number of themes and could devote more time to the comparatively small and rotating number of themes that they retained to grade.

One teacher reports that the students believe they received more objective grading from two people. Students also were said to appreciate the additional suggestions for improvement.

Lay readers here were guaranteed 90 papers per week and were paid $1.50 per hour.

Ford Gives $2.7 Million for Teacher Education

NEW YORK. — To support new programs in teacher education, the Ford Foundation has made a series of grants to eight colleges and universities. The grants total $2,761,250.

Individual grants are as follows: Converse College, $430,000; University of Kansas City, $625,000; Kansas State University, $179,000; Middlebury College, $111,500; Northwestern University, $325,000; University of Notre Dame, $410,750; Oberlin College, $190,000, and University of Pittsburgh, $490,000.

These grants are the third in a series begun in March 1959 to advance a national "break-through" in the education of elementary and high school teachers.

New York To Offer Standard School Designs

ALBANY, N.Y. — Standard designs for school buildings will be available to districts here as the result of a bill passed by the state legislature.

The law requires the superintendent of public works to prepare a minimum of 18 different plans that school systems may buy at nominal cost. The plans shall "provide adequate classrooms and other necessary space and facilities at the lowest cost consistent with sound construction principles and practices and the attainment of education objectives," the legislation instructs.

At the annual convention of the American Institute of Architects held in San Francisco, John N. Richards, president of the group, charged that "stock plans actually result in higher costs to the taxpayer." Also, stock plans "freeze design for several years, when it could be a continuously changing concept," he said.

"Twenty-six other states have tried stock plans, and all have found them unworkable. Our main objection to them is that they do not produce good schools.

"Every school must be designed to meet the particular needs of its community. It presents its own problems of design, and solving them one way for a community might result in a school that is wrong for another community," Mr. Richards declared.

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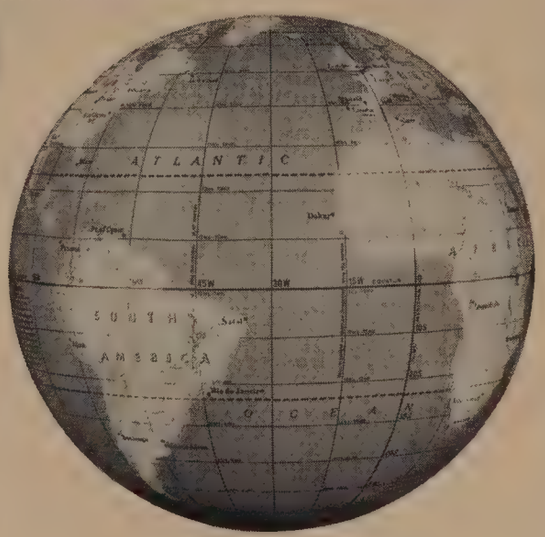

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About People

Changes in Superintendencies

NORTHEAST

Bernhard W. Schneider, Rutherford, N.J., to Northport, N.Y.

Walter E. Schoenborn, supervising principal, Berne-Knox Central School, Berne, N. Y., to assistant superintendent for business affairs, Amsterdam, N.Y.

Lehman C. Shugart, assistant superintendent, Elizabeth, N.J., to superintendent, Roselle, N.J., succeeding **William C. Heugh,** who goes to Port Jefferson, N.Y.

Levin B. Hanigan, coordinator of elementary education, Arlington County, Arlington, Va., to superintendent, Mountainside, N.J. He succeeds **Charles J. Wadas,** who resigned.

Stephen Beaton Jr., high school principal, Millbury, Mass., to superintendent there, succeeding **William D. Shea,** who retired after 44 years in the field of education.

Chester R. Stroup, elementary school principal, Georgetown, Del., to superintendent, Princeton, N.J.

Clayton Hitchner, high school vice principal, East Rutherford, N.J., to superintendent there.

Thomas P. Curtin, principal, Paweatuck Junior High School, Stonington, Conn., to superintendent there.

George M. Sharp, director of instruction and guidance, Montclair, N.J., to assistant superintendent in charge of the instructional program there. **James B. Boyd,** assistant high school principal, Montclair, to administrative assistant to the superintendent there.

Fred H. Combs, acting assistant superintendent, Lawrence Township School District, Lawrenceville, N.J., to superintendent there.

John C. Dunlap, principal, Governor Mifflin Joint High School, Shillington, Pa., to supervising principal there. He succeeds **Robert L. Adams,** who becomes supervising principal, Eastern Joint School District, Wrightsville, Pa.

Harold T. Wiley, assistant superintendent in charge of instruction, Watertown, N.Y., to superintendent there.

Fred Schoenberg, assistant superintendent, high school division, New York City, to associate superintendent in charge of the division, succeeding **C. Frederick Pertsch,** who becomes deputy superintendent for instruction. **Margaret Douglas,** elementary school principal, to assistant superintendent in charge of districts 43 and 44, succeeding **Charles J. Eichel,** who retired. **Thomas F. Nevins,** assistant superintendent in charge of districts 41 and 42, to assistant to the city superintendent. He succeeds **Clare C. Baldwin,** who becomes associate superintendent in charge of the special services division. Dr. Baldwin succeeds **Edward J. Bernath,** who will be in charge of the child welfare division. Mr. Bernath succeeds **John B. King,** who becomes head of the elementary schools division. **Richard M. Lubell,** assistant administrative director, has been appointed assistant superintendent in the child welfare division.

Alfred W. Heath, high school principal, Dumont, N.J., to superintendent there, succeeding **Charles A. Selzer,** who retired.

William R. Flinn, high school principal, Merchantville, N.J., to superintendent there.

William G. Fiedler, assistant superintendent, Union City, N.J., to superintendent there.

Clark C. Carnel, assistant superintendent, Board of Cooperative Educational Services, New York Mills, N.Y., to superintendent, East Syracuse, N.Y.

Philip P. Grover, Union 7, Brookfield, Mass., to Rockland, Mass., succeeding **R. Stewart Esten,** who retires.

Harold Hench, senior high school principal, Shaler Township Schools, Glenshaw, Pa., to supervising principal there, succeeding **R. C. Rogers,** who retires.

(*Cont. on P.* 162)

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DuKane sound
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(*Continued From Page* 160)

J. H. Brooks, high school principal and administrative assistant, Moon Township Schools and Moon Union School District, Coraopolis, Pa., to supervising principal there. He succeeds **J. H. Allard,** who retired after 41 years in the education field. **Joseph Siegman,** administrative assistant, becomes assistant supervising principal.

Maurice E. Friot, assistant superintendent, North Tonawanda, N.Y., to superintendent there.

MIDWEST

Warren M. Brown, former special consultant, U. S. Office of Education, to assistant superintendent in charge of personnel and general administration, R-2 Ferguson-Florissant School District, Ferguson, Mo.

C. C. Loew, Urbana, Ill., to Elmwood Park, Ill.

William Miller, superintendent, Oregon Local School District, Toledo, Ohio, to administrative assistant in charge of curriculum and instruction there.

Max Wiesman, high school principal, Franklin, Ind., to superintendent there.

Dennis Malcolmson, superintendent, Prospect Heights, Ill., to administrative assistant, Ridgewood High School, Norridge, Ill.

Allen E. Rupp, Fremont, Ohio, to Marietta, Ohio.

Kenneth Gardner, Nelson, Neb., to Falls City, Neb.

Fred A. Siekmann, acting superintendent, School District No. 148, Dolton, Ill., to superintendent there.

Ralph Shaw, principal, West Pullman School, Chicago, to superintendent, Mackinaw City, Mich.

Herbert Erdmann, acting superintendent, Evansville, Ind., to superintendent there.

Charles S. Wisehart, Greenfield, Ind., to Tipton-Cicero School District, Tipton, Ind. He succeeds **C. B. Stemen,** who becomes business manager there.

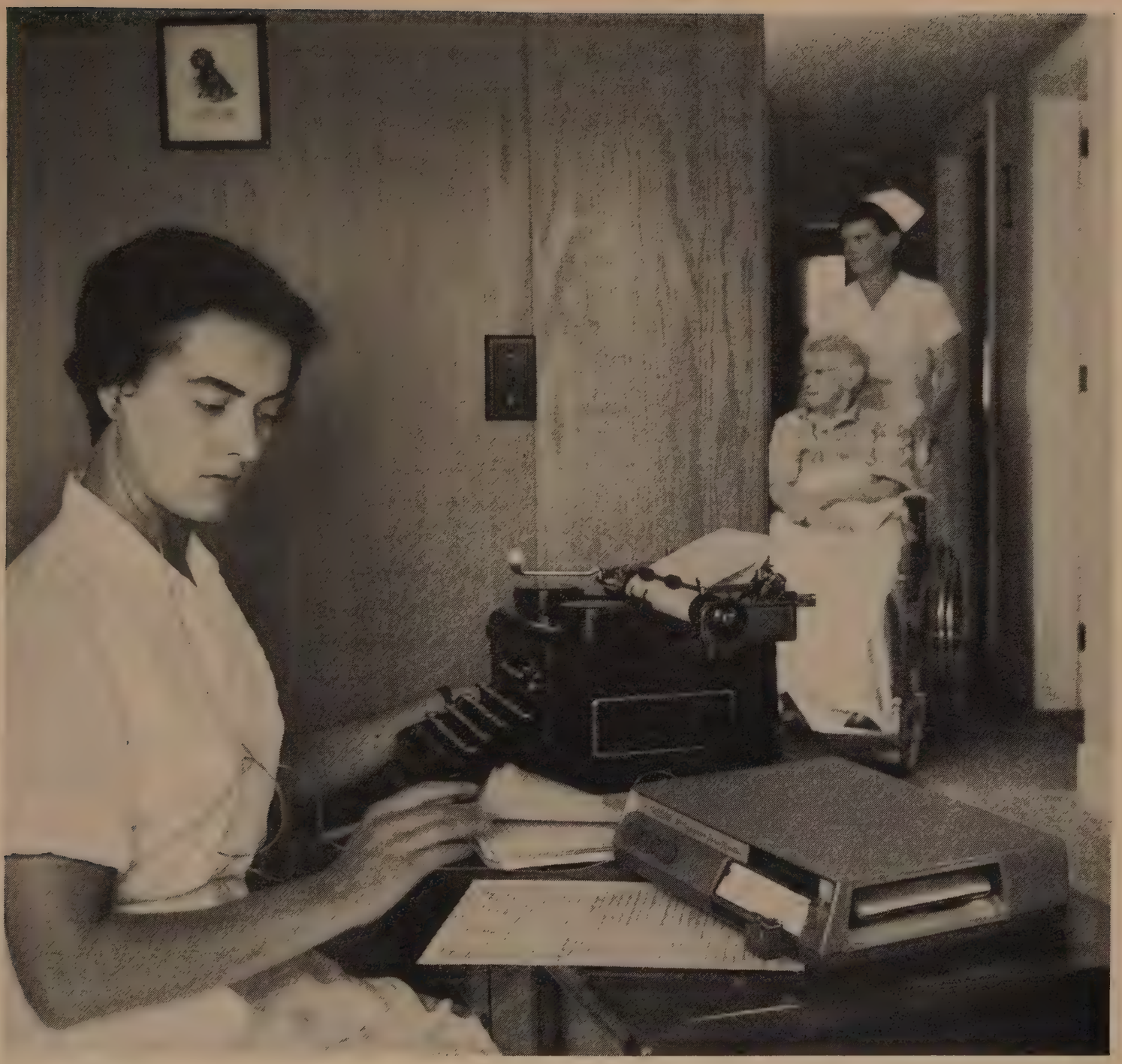
Charles Owens, principal, Cannelton, Ind., to superintendent there. He succeeds **Herman Snyder,** who goes to Princeton, Ind.

Virgil J. Briegel, Clyde, Ohio, to Allen County, Lima, Ohio, succeeding **Willard Floyd,** who retired.

Paul C. Hayes, Dover, Ohio, to South-Western City School District, Columbus, Ohio.

G. L. Rader, Ridgeville Local School District, North Ridgeville, Ohio, to Jackson Local School District, Massillon, Ohio. He succeeds **H. C. Sauder,** who retired.

Willard J. Congreve, principal, Von Humboldt Elementary School, Chicago,



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Standard Model

Pre-wash Model

3 Deep Tub Model

Pot 'n Pan Washer

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to principal, University of Chicago High School, succeeding **Robert Ohm,** who has been appointed staff associate in teacher education at the university. Dr. Congreve also was appointed assistant professor in the department of education there.

A. O. Gross, Covington, Ohio, to Marion County, Marion, Ohio.

Richard Gruetzemacher, Jefferson County Reorganized School District, House Springs, Mo., to Valley Park, Mo.

Tom Vaughan, high school principal, Carson City, Mich., to superintendent there.

James Bottenfield, Ledyard, Iowa, to Lone Tree, Iowa.

Ted Wodzinski, teacher and coach, Munising, Mich., to superintendent, Bates Township School District, Iron River, Mich.

Burton G. Halverson, superintendent, Carroll County, Carroll, Iowa, to superintendent, Pottawattamie County, Council Bluffs, Iowa. He succeeds **Ernest W. Barker,** who becomes director of curriculum, Waterloo, Iowa.

R. A. Barr, high school principal, Marshfield, Mo., to superintendent, School District R-1 there.

Arthur H. Oestreich, Kenilworth, Ill., to Northbrook, Ill. He succeeds **Frank Snyder,** who resigned.

E. W. Eggers, Wanamingo, Minn., to Cannon Falls, Minn., succeeding **O. D. Hanson,** who becomes business manager, Columbia Heights, Minn.

Raphael Elsea, Bridgewater-Fontanelle School District, Fontanelle, Iowa, to Nashwauk-Keewatin School District, Nashwauk, Minn., succeeding **Maurice Weinberger,** who resigned.

Robert L. Walter, former high school principal, Indian Hill, Ohio, to superintendent there, succeeding **C. M. Patrick,** who retired.

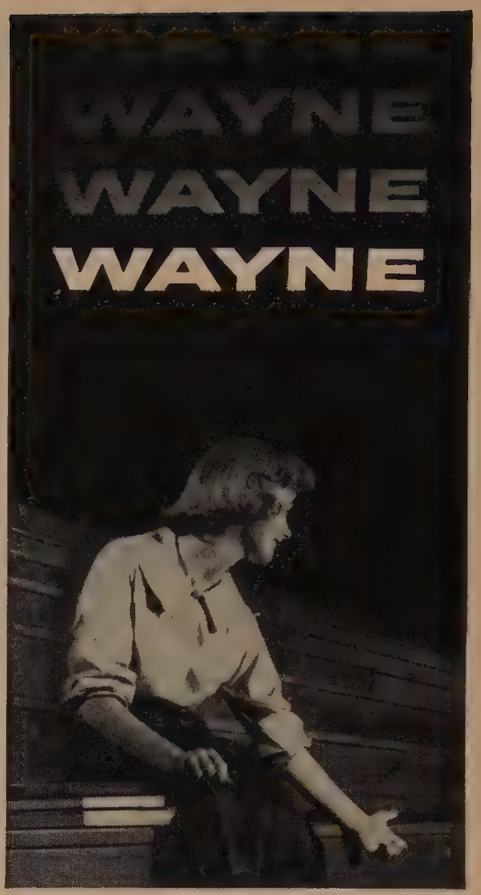
SOUTHEAST

Jack K. Randolph, Doddridge County, West Union, W.Va., to Berkeley County, Martinsburg, W.Va., succeeding **Paul V. Yost,** who has accepted a position at Fairmont State College, Fairmont, W.Va.

Edwin L. Lamberth, assistant superintendent, Norfolk, Va., to superintendent there.

James B. Graham, Nelson County, Bardstown, Ky., to Kenton County, Independence, Ky. He succeeds **James A. Caywood,** who remains with the system as an adviser until retirement.

Edwin R. Ward, principal, Russell Cave School, Lexington, Ky., to superintendent, Warren County, Bowling Green, Ky., succeeding **C. T. Clemons,** who resigned. (*Cont. on p.* 168)



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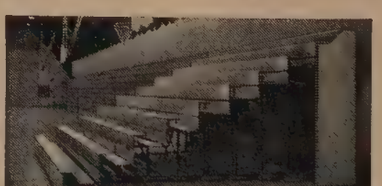

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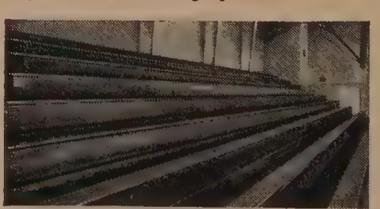

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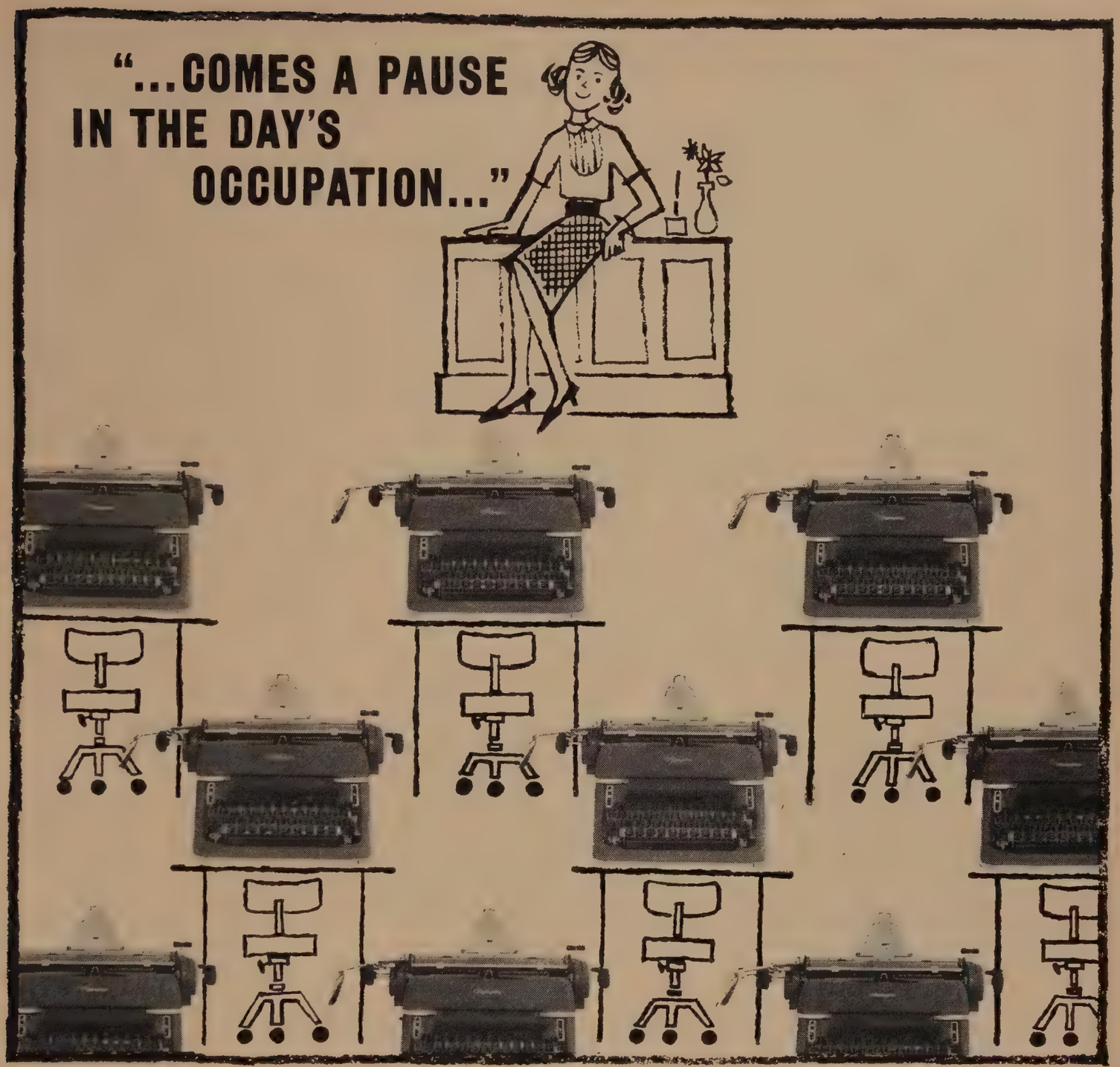

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(*Continued From Page* 166)

W. Troy Floyd, high school principal, Van, W.Va., to superintendent, Boone County, Madison, W.Va., succeeding **Clarence D. Tamplin,** who joins the faculty of Morris Harvey College, Charleston.

SOUTH CENTRAL

Wallace R. Neece, high school principal, Jacksonville, Ark., to superintendent, Blevins, Ark.

Carlton Chambers, superintendent, Perryville, Ark., to assistant superintendent, Jacksonville, Ark.

Gordon Ross, high school coach, Benavides, Tex., to superintendent there.

Jerry Kirk, Muleshoe, Tex., to Elk City, Okla.

WEST

Norman R. Naegle, deputy elementary superintendent, San Mateo, Calif., to superintendent there, succeeding **Walter A. Jack,** who resigned.

John H. Stevens, Rochester, Wash., to Burlington-Edison School District, Burlington, Wash.

John L. Owen, superintendent, South Summit School District, Kamas, Utah, to assistant superintendent, Weber County, Ogden, Utah.

Lloyd A. Muldown, teacher, School District No. 44, Whitefish, Mont., to superintendent there.

Norbert Baugh, Peshastin-Dryden School District, Peshastin, Wash., to Omak, Wash.

Stephen Shuster, Hudson, Colo., to Louisville, Colo., succeeding **R. D. Swartz,** who goes to Estes Park, Colo. He succeeds **Walter L. Edwards,** who resigned.

Robert Chisholm, School District No. 101, Sedro-Woolley, Wash., to Richland, Wash., succeeding **Neal McClure,** who retired.

George E. Powell, Dietrich, Idaho, to Aberdeen, Idaho, succeeding **R. A. Weston,** who retired.

Jack Finch, assistant state commissioner of education, Juneau, Alaska, to superintendent, Ketchikan, Alaska, succeeding **J. E. Danielson,** who resigned.

Charles James, assistant superintendent, Coronado, Calif., to superintendent there, effective September 9. He succeeds **Amos E. Schaefer,** who retires.

William Hurley, high school principal, Taylorville, Ill., to superintendent, Fort Logan, Colo., succeeding **Alice B. Terry,** who was named coordinator there.

Lew Carr, Manzanola, Colo., to Homer, Alaska.

Russell M. Esvelt, acting superintendent, San Juan Union High School District, Carmichael, Calif., to superintendent, Chico, Calif. He succeeds **Roger B. Everly,** who resigned.

(*Continued on Page* 170)

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National Lock offers you the right combination of sound engineering features for years of dependable security. Masterkeyed and non-masterkeyed combination locks are convenient to use, too! Three-number dialing . . . simplified re-setting of combinations . . . complete system of locker control. Master charts for lock records are supplied FREE. Write on your letterhead for FREE sample lock, specifying built-in or shackle type.

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(*Continued From Page* 168)

Elmer F. Stolte

Elmer F. Stolte, principal, Maine Township High School East, Park Ridge, Ill., to first assistant superintendent, Oakland, Calif. Dr. Stolte was a physical and social science teacher and coach at Clearmont, Wyo., and then went to O'Neill, Neb., where he served in the same capacity for seven years. He became assistant principal at Maine Township in 1950.

Glen C. Nicholson, superintendent, Midland, Calif., to elementary superintendent, Buena Park, Calif. He succeeds **Carl W. Gilbert,** who resigned.

Harmon Colby, Riverside School District No. 416, Milan, Wash., to Lower Snoqualmie Valley School District No. 407, Carnation, Wash.

Other Appointments . . .

William J. Kesl, director of food service at Rutgers University, New Brunswick, N. J., has been appointed coordinator of cafeterias, Newark, N. J.

Robert L. Randall, high school principal, Lumberton, N. C., has been appointed head of the placement bureau, Appalachian State Teachers College, Boone, N. C.

Morris W. Rannels, superintendent, Cecil County, Elkton, Md., has accepted the position as supervisor of public school transportation, Maryland Department of Public Education, Baltimore.

Allen R. Schwarz, chairman, department of education, North Central College, Naperville, Ill., has been appointed director of student teaching and principal, John D. Pierce Laboratory School, Northern Michigan College, Marquette, succeeding **Ed Pfau,** who was appointed dean of education there. He succeeds **William C. Hoppes,** who retired.

Reese E. Dukes, supervising principal, Marshallton, Del., has accepted a position as director of secondary education, Girard College, Philadelphia.

Clara E. Cockerille, assistant superintendent, Armstrong County, Kittanning, Pa., has accepted the position as professor of education, graduate program of school administration, Westminster College, New Wilmington, Pa.

William A. Medesy, president, State University Agricultural and Technical Institute, Farmingdale, N.Y., to dean, Rangely branch of Mesa County Junior College, Grand Junction, Colo. The new college is expected to open in the fall of 1961.

Byron W. Hansford, associate professor of education, Michigan State University, East Lansing, to Colorado state commissioner of education, Denver.

Resignations . . .

Eldon L. Wiley, Bradford, Ohio.

Clyde L. Ball, Morgan County, Berkeley Springs, W.Va.

Charles Olbon, West Paterson, N. J.

Edwin E. Will, Bath County, Warm Springs, Va.

Maurice Gemmell, business manager, Union High School District, Glendale, Ariz.

Ernest L. Cavallo, Elk Grove School District No. 59, Arlington Heights, Ill.

Edgar C. Perry, superintendent for the last two years at Somerville, N.J.

H. Arthur Mills, supervising principal, Boyertown, Pa. He has been reassigned as a science teacher.

Wiley W. Loughmiller, Cameron, Tex.

Arthur F. Jordan, La Crosse, Wis.

Revis D. Blakeney, Thomasville, Ga.

Sam O. Avery, Burlington, Kan.

Silbert Lanman, Capron, Okla.

Harrison Bennett, Laketon School District, Muskegon, Mich.

Edwin A. Juckett, district principal, Central School District No. 1, Smithtown, N.Y.

(*Cont. on p.* 172)

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Builder of Sheldon Lathes, Milling Machines, Shapers and Sebastian Lathes

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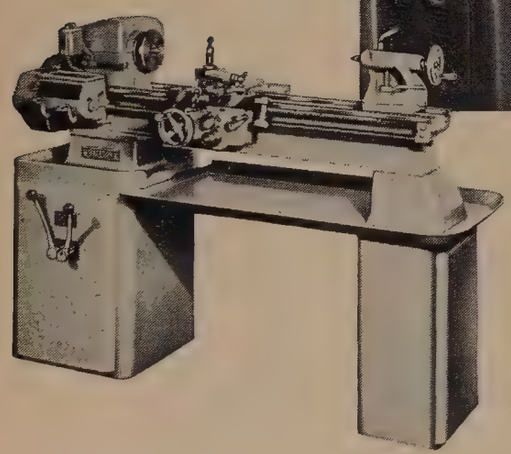

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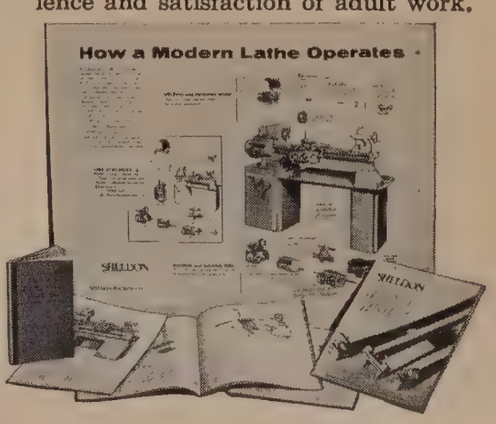

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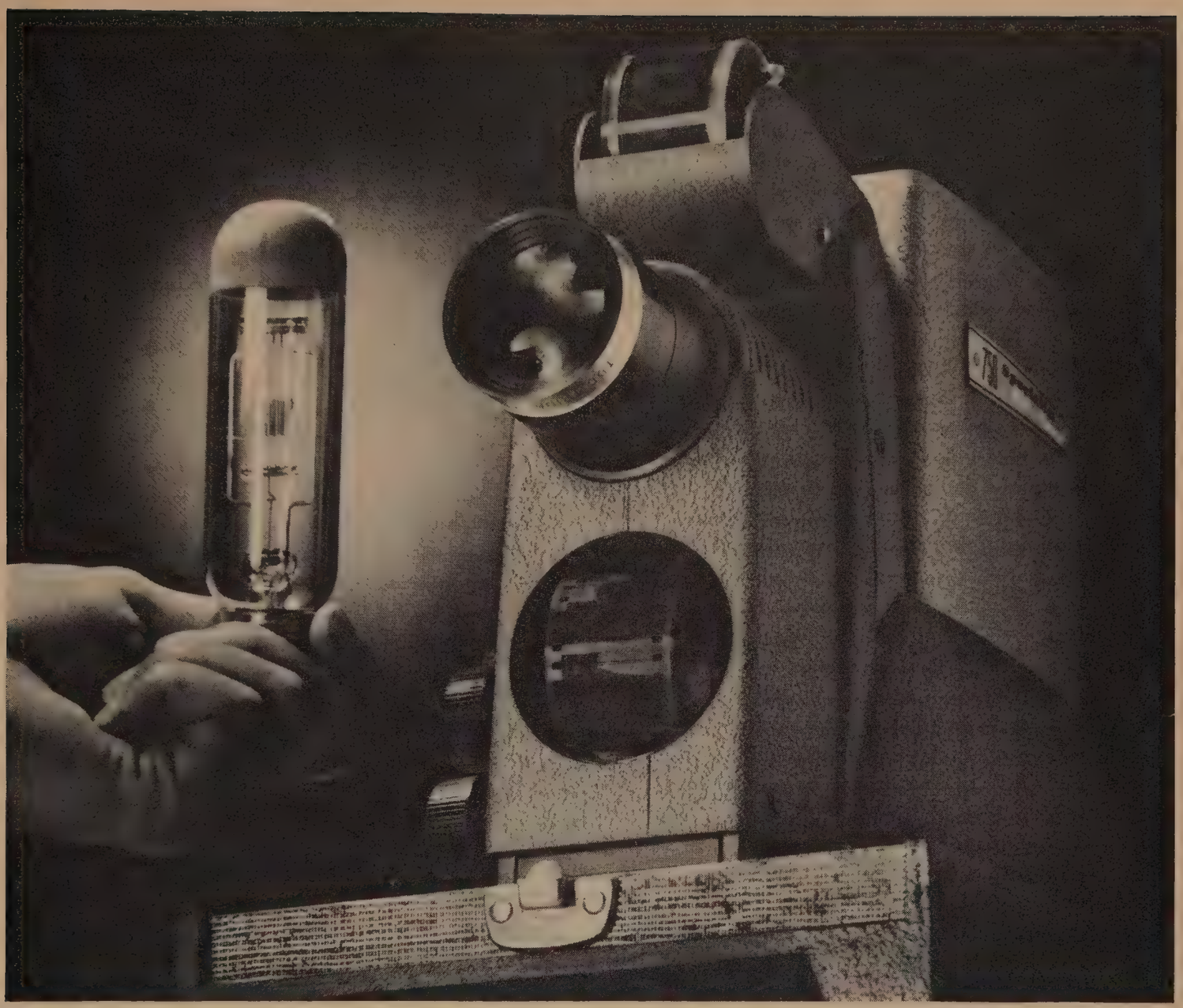

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Retirements . . .

Jacob Greenberg, deputy superintendent, New York City schools, Brooklyn, N. Y., after 50 years in the city's school system.

R. O. Derrick, Edgefield, S. C. He will remain there in an advisory and administrative capacity.

Victor R. Blauch, supervising principal for 33 years, Leechburg, Pa.

Lawrence Reardon, Braddock, Pa.

James E. Reynolds, Jersey City, N. J.

C. B. West, Henderson County, Henderson, Ky.

Peter C. Holm, assistant superintendent in charge of personnel, Denver.

Rayburn W. Cadwallader, principal, Withrow Junior High School, Cincinnati.

Paul B. Hanawalt, Puyallup, Wash.

C. G. Lappin, superintendent for 34 years, Shawnee Local School District, Lima, Ohio.

J. B. Woodside, Willoughby-Eastlake Schools, Willoughby, Ohio, effective August 1961.

H. H. Robinson, Augusta, Kan., after 43 years as a teacher, principal and superintendent there.

Frank H. Johnston, superintendent for 39 years of the Brookfield, Bridgewater, Roxbury, Sherman, Washington and New Fairfield school districts, New Milford, Conn.

Eber L. Palmer, superintendent for 23 years of the State School for the Blind, Batavia, N.Y. Dr. Palmer has served as superintendent in Radcliff and Vinton, Iowa.

Frank J. Snider, superintendent for 23 years of Johnson County, Iowa City, Iowa.

Henry E. Kentopp, East Orange, N.J.

Deaths . . .

William Woodson Trent, 82, former West Virginia state superintendent of schools for six consecutive terms, Charleston. He was secretary of the state education association from 1919 to 1927 and editor of the West Virginia School Journal in 1923-24 and 1926-27.

Arthur C. Carpenter, 54, Iowa assistant superintendent of public instruction, Des Moines.

Clement W. Hunt, 76, former superintendent, Lock Haven, Pa.

Howard McKibben, South Whittier, Calif.

Lucien Abraham, 58, former superintendent, Desha, Ark.

Willis A. Sutton, 81, superintendent emeritus, Atlanta. He was superintendent there from 1921 to 1944. Dr. Sutton served as president of the National Education Association during 1930-31.

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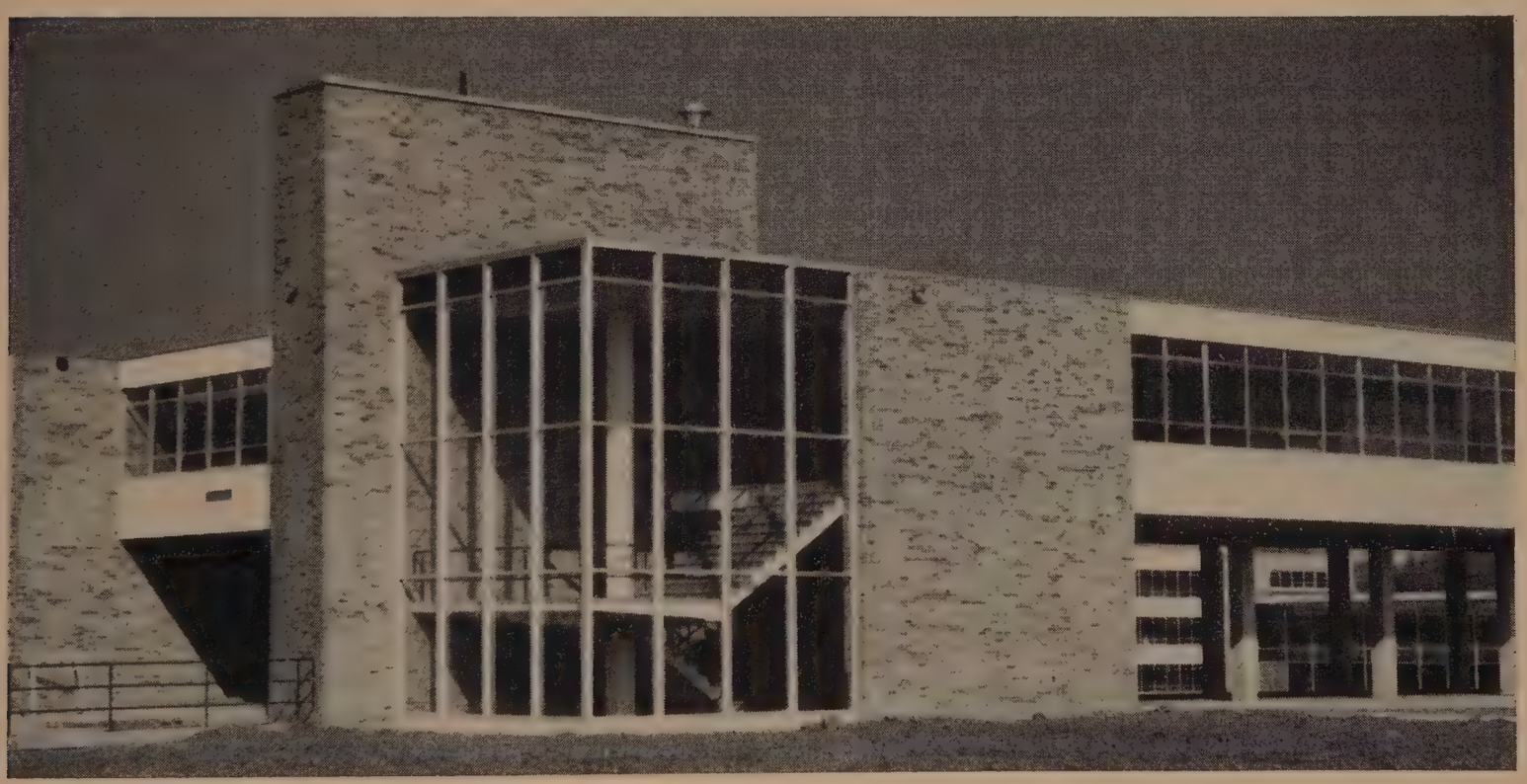

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Administrative Relationships. A casebook. Jack A. Culbertson, University Council for Educational Administration, Paul B. Jacobson, University of Oregon, and Theodore L. Reller, University of California. Prentice-Hall. Pp. 508. $6.75.

The High School Principal and Staff Develop the Master Schedule. Noble Gividen and David B. Austin. Columbia University. Pp. 104. $1.25.

AUDIO-VISUAL

Children and Television. Wilbur Schramm, Stanford University. Television Information Office, 666 5th Ave., New York 19. Pp. 18.

Educational Motion Pictures, 1960. Department of visual instruction, Oregon State System of Higher Education, Coliseum Building 131, Corvallis, Ore. Pp. 232. 50 cents.

Interaction in Learning: Implications for Television. Prepared by Finette P. Foshay. Report of a seminar. N.E.A. Pp. 62. $1.

The Audio-Visual Equipment Directory. 6th ed. Edited by James W. Hulfish Jr., National Audio-Visual Association, Inc., Fairfax, Va. Pp. 265. $4.75.

Educators Guide to Free Films, 1960. 20th ed. Compiled and edited by Mary Foley Horkheimer and John W. Diffor. Educators Progress Service, Randolph, Wis. Pp. 639. $9.

BUSINESS MANAGEMENT

Business Management of Local School Systems. Stephen J. Knezevich, University of Iowa, and John Guy Fowlkes, University of Wisconsin. Harper. Pp. 311. $9.

COMPARATIVE EDUCATION

A Firsthand Report on Soviet Schools. Based on a trip through the U.S.S.R. by 64 American educators. N.E.A. Pp. 63. $1.

CURRICULUM

Curriculum Development in the Elementary School. W. Ray Rucker, National College of Education, Evanston, Ill. Harper. Pp. 405. $5.

Educating for Economic Competence. A report prepared by the A.S.C.D. Commission on Education for Economic Competence, N.E.A. Pp. 78. $1.

The Unified Curriculum. A case study, Grades 7-8. Joseph S. Butterweck, Temple University, and Katharine H. Spessard, Radnor Township Junior High School, Wayne, Pa. Rinehart. Pp. 60. $1.

The Secondary School Curriculum. Edward A. Krug, University of Wisconsin. Harper. Pp. 550. $6.

Using Community Resources Within the Curriculum. Harold R. Bottrell, University of Houston. Gulf School Research Development Association, 3801 Cullen Blvd., Houston 4. Pp. 20. 50 cents.

EDUCATIONAL HISTORY

Educational Ideals in American Society. Robert E. Mason, University of Pittsburgh. Allyn & Bacon. Pp. 328. $5.50.

EDUCATIONAL PHILOSOPHY

Democratic Educational Theory. Ernest E. Bayles, University of Kansas. Harper. Pp. 259. $4.75.

Dewey on Education. Selections with an introduction and notes by Martin S. Dworkin. Columbia University. Pp. 134. $1.25.

ELEMENTARY EDUCATION

Focus on Values in Elementary Education. Laura Zirbes, Ohio State University. G. P. Putnam's Sons. Pp. 233. $4.50.

FINANCE

Financing the Public Schools. Roe L. Johns, University of Florida, and Edgar L. Morphet, University of California. Prentice-Hall. Pp. 554. $9.

Budgeting for Better Schools. Leon Ovsiew, Temple University, and William B. Castetter, University of Pennsylvania. Prentice-Hall. Pp. 328. $7.95; text edition, $5.95.

Public School Finance Programs of the United States, 1957-58. Prepared under

(*Continued on Page* 178)

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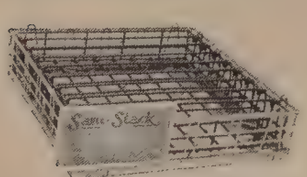

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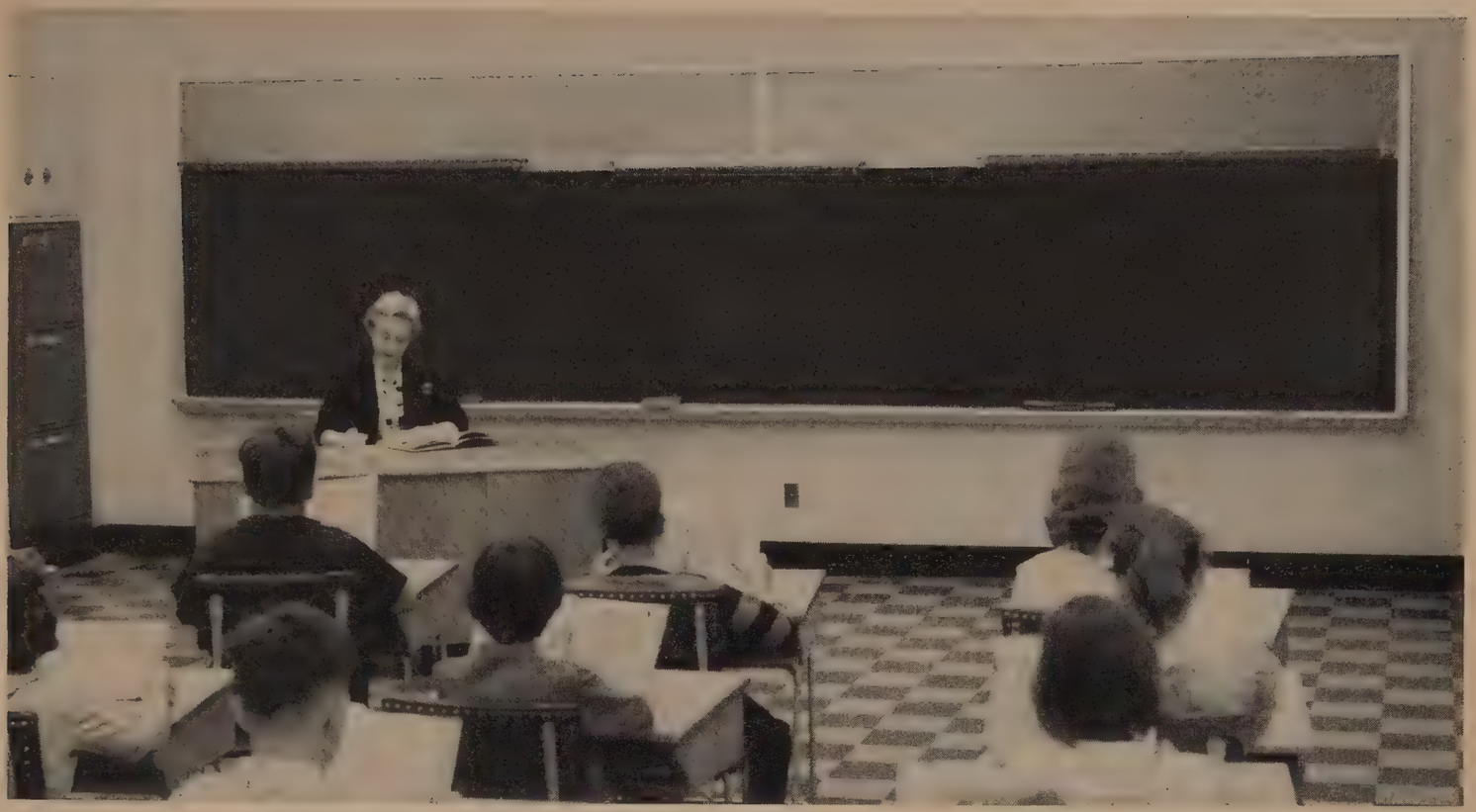

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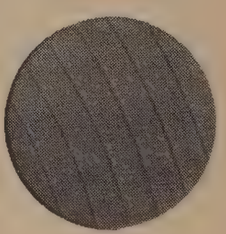

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Guidance Readings for Counselors. Edited by Gail F. Farwell, University of Wisconsin, and Herman J. Peters, Ohio State University. Rand McNally. Pp. 677.

Guidance in Elementary Education. Revised ed. Roy DeVerl Willey, University of Nevada. Harper. Pp. 450. $6.

Guidance of the Young Child. Louise M. Langford, Kansas State University. John Wiley & Sons. Pp. 344. $6.25.

When Children Move From School to School. Edited by Margaret Rasmussen. Association for Childhood Education International, Washington 16, D. C. Pp. 32. 75 cents.

INSTRUCTION

Mathematics and Industrial Arts Education. Prepared by the Mathematics-Industrial Arts Project Committee. Calif. State Prtg. Off., Sacramento. Pp. 100.

METHODS AND MATERIALS

Free and Inexpensive Learning Materials. 10th ed. Division of surveys and field services, George Peabody College for Teachers, Nashville 5, Tenn. Pp. 252. $1.50.

Learning About Role-Playing for Children and Teachers. Hildred Nichols and Lois Williams, Unified School District, Montebello, Calif. Association for Childhood Education International, Washington 16, D. C. Pp. 40. 75 cents.

PHYSICAL EDUCATION

Teaching Physical Education in the Elementary School. 2d ed. Grace I. Fox, Florida State University, and E. Benton Salt and B. K. Stevens, University of Florida. Ronald Press. Pp. 456. $6.

PRIMARY EDUCATION

Early Childhood Education. Hazel M. Lambert, Fresno State College. Allyn & Bacon. Pp. 427. $5.95.

PSYCHOLOGY

Anxiety in Elementary School Children. A report of research. Seymour B. Sarason, Kenneth S. Davidson, Frederick F. Lighthall, Richard R. Waite, and Britton K. Ruebush, all of Yale University. John Wiley & Sons. Pp. 343. $7.75.

SCIENCE EDUCATION

Physics in Your High School. Prepared by the American Institute of Physics. McGraw-Hill. Pp. 134. $1.50.

SECONDARY EDUCATION

The American Secondary School. L. O. Taylor, formerly of the University of Omaha; Don R. McMahill, Omaha Technical High School, and Bob L. Taylor, San Francisco State College. Appleton-Century-Crofts. Pp. 481. $5.50.

The General Education Class in the Secondary School. Louise E. Hock, New York University, and Thomas J. Hill, University of Florida. Rinehart. Pp. 225. $4.

New Directions to Quality Education. J. Lloyd Trump, National Association of Secondary-School Principals, N.E.A. Pp. 15. Free.

The Educational Value of Pupil Activities. Homer H. Hamilton. Mae Cowan, secretary, The Texas Study of Secondary Education, 217 Sutton Hall, University of Texas, Austin. Pp. 36. $1.

SPECIAL EDUCATION

The Exceptional Child. A book of readings. Edited by James F. Magary and John R. Eichorn, Indiana University. Holt, Rinehart and Winston. Pp. 554. $5.50.

The Challenge of Educating the Blind Child in the Regular Classroom. Bureau for handicapped children, New York State Education Department, Albany 1. Pp. 16. (*Cont. on p.* 180)

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Allyn & Bacon, Inc., college division, 150 Tremont St., Boston 11.
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Columbia University, bureau of publications, Teachers College, 525 W. 120th St., New York 27.
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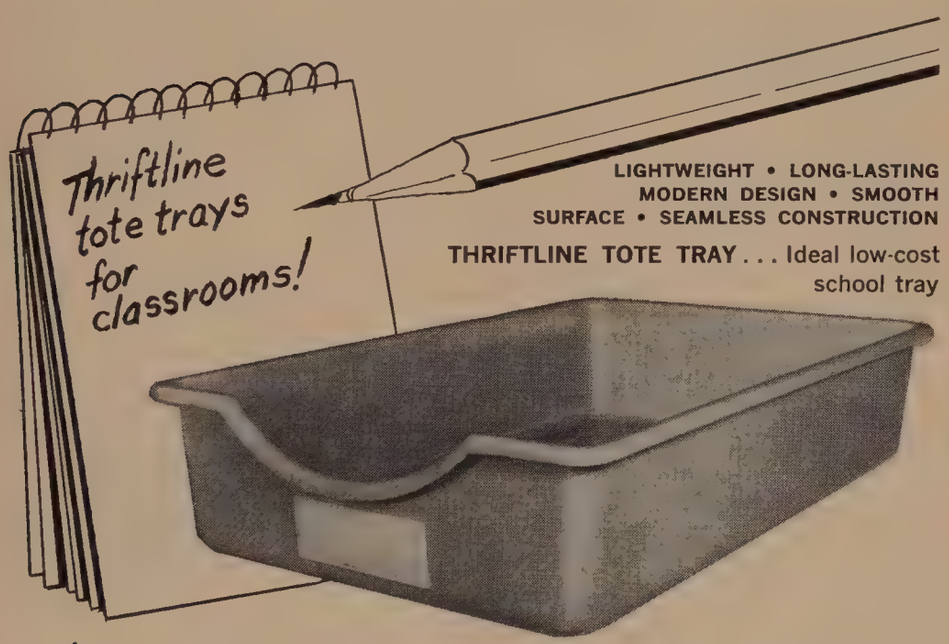

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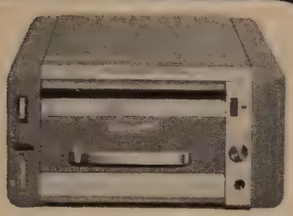

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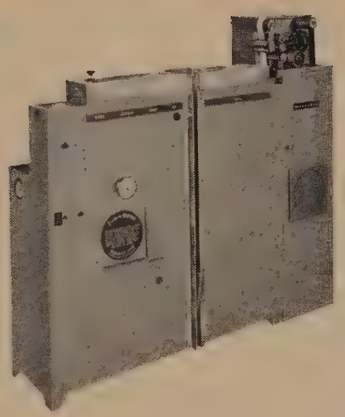

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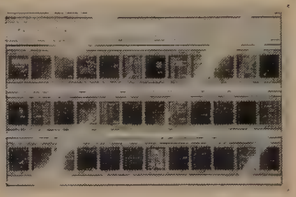

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Coming Events

OCTOBER

2-6. American School Food Service Association, Washington, D.C.

4-7. National Council on Schoolhouse Construction, Toronto, Ont.

7-12. Department of Rural Education, N.E.A., Louisville, Ky.

9-13. Association of School Business Officials of the United States and Canada, St. Louis.

14-16. National Association of Public School Adult Educators, Denver.

17-21. National Safety Council, Chicago.

NOVEMBER

6-7. Association of Urban Universities, Cincinnati.

6-12. American Education Week.

23-26. National Council for the Social Studies, Boston.

FEBRUARY

11-15. National Association of Secondary-School Principals, Detroit.

25-28. American Association of School Administrators, regional meeting, San Francisco.

MARCH

5-8. Association for Higher Education, Chicago.

11-14. American Association of School Administrators, regional meeting, St. Louis.

12-16. Association for Supervision and Curriculum Development, N.E.A., Chicago.

18-22. Department of Elementary School Principals, N.E.A., Atlantic City.

25-28. American Association of School Administrators, regional meeting, Philadelphia.

26-30. National Science Teachers Association, Chicago.

APRIL

5-8. National Council of Teachers of Mathematics, Chicago.

11-15. National Art Education Association, Miami Beach.

16-22. National Library Week.

24-27. Department of Audio-Visual Instruction, N.E.A., Miami Beach.

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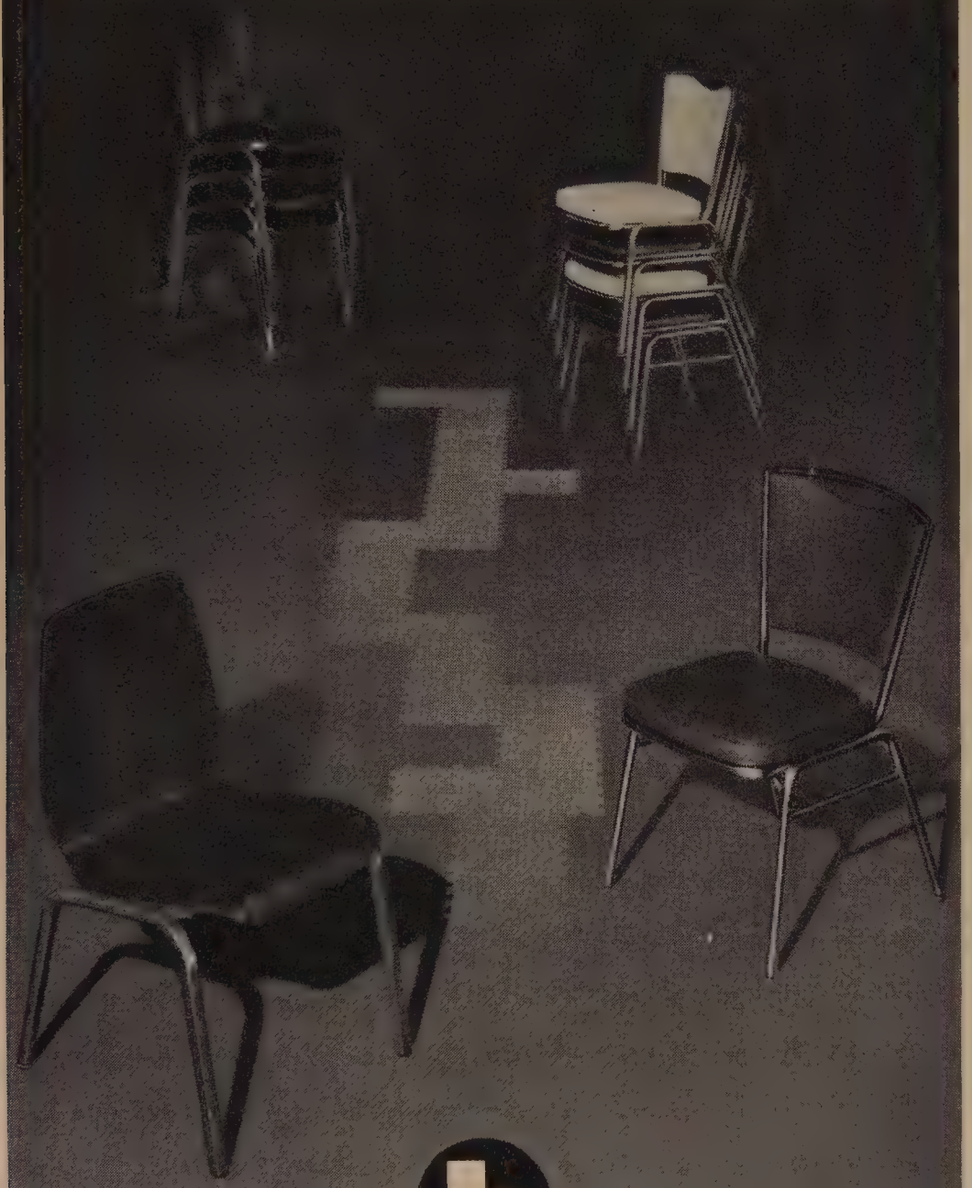

HOWELL

427 S. First St., St. Charles, Ill.

(*Continued From Page* 10)

religious schools as such; it would simply aid parents to exercise their fundamental freedom of educational choice. What this means is that the earlier demand for indirect aid for peripheral welfare services in justice to children has become a demand for direct financial subsidy by government or at least tax credit as a constitutional right of parents.

"The *principle* of liberty and of civil rights *requires* the state to *subsidize* parents by full government support for the education of their children and, if the state refuses such aid, it would be infringing their rights of freedom of conscience (under the First Amendment). In other words, the state must subsidize parents to enable them to exercise the freedom to which they are entitled. Furthermore, if the state refuses such subsidy it will also be discriminating against parents who exercise freedom of conscience by denying them equal protection of the laws (under the Fourteenth Amendment).

"As if these arguments of the last decade were not enough of a threat to the public school idea, we see this same principle of educational freedom for parents being applied to the problem of segregation in the South. Just as parents who want their children to go to religious schools should have their fair share of state aid, so parents who want their children to go to all-white schools should have *their* share of state aid."

And Dr. Butts concludes: "I believe that the adoption of the subsidy principle would undermine if not destroy the public school system as we have known it for nearly 150 years. But, more important, I believe it would weaken the fabric of American society. I believe that it would reinforce the exclusiveness and the separateness that now tend to prevent communication and increase suspicion among Catholic, Protestant and Jew. Separateness need not automatically produce divisiveness, but it is likely to do so when sedulously cultivated generation after generation."

Warning against direct grants to schools or indirect grants through subsidies to parents or children, Professor Butts said: "Once subventions are begun for some purpose the claim will be extended until full support is achieved and the public schools themselves are weakened or undermined. Undermining free public schools is tantamount to undermining free government itself. Since free public education is essential for the maintenance of republican government and of free institutions, *this* is the reason why everyone must pay taxes for public schools. Education is for the benefit of individuals, yes; but, even more, it is for the sustenance of the free society which nourishes the free individuals."

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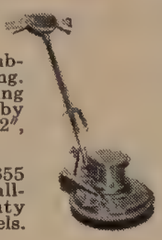

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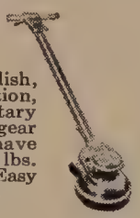
MC-31—31″ machine with covering area of 855 sq. in. for cleaning, polishing, steel wooling hallways, large unobstructed areas. Heavy-duty construction, operation similar to other models.

EXPLOSION-PROOF FLOOR MACHINE—For mechanical floor maintenance in hazardous areas without danger of fire or explosion. Can be used near and in combustible material with absolute safety. All electrical components are listed by U/L. Brush sizes: 14″ and 16″. Heavy-duty switch and 40 ft. Neoprene-covered 3-conductor cord.



LITE-12 and LITE-14 FLOOR MACHINES—Scrub, wax, polish, steel wool all types of floors. Low, balanced construction, efficient, rugged. Finger-tip lever-operated momentary contact type switch. Direct ball bearing greaseless gear drive. ½ hp AC motor, 30′ cord. Lite-12 and Lite-14 have 12″ and 14″ brush diameters; weigh only 38 and 40 lbs. respectively. Plastic bumpers surround base and top. Easy on-off attachments. U/L listed. Solution tank available.

IMPERIAL SERIES VACUUM CLEANERS—Wet and dry pickup. Special motor and turbine design gives powerful pick-up at much lower rpm than most other vacs. Automatic shut-off when tank fills to capacity. ½, 1, and 1½ hp motors available with 7, 12, and 17 gallon tanks. Washable, quick-drying filter won't rot or mildew. Drain valve and plastic bumper on all tanks. Big wheels. Detachable cable.

D-110 VACUUM CLEANER—For dry pickup. Weighs only 29 lbs. ½ hp Universal motor has long life. Precision ball bearings factory-sealed and lubricated. 2-stage turbine has powerful suction, water lift of 66″. Sturdy all-welded tank holds ½ bushel dry material. 8′ x 1½″ flexible hose. All attachments.

F-300 VAC-BLOWER—All-purpose industrial vacuum cleaner and a powerful blower. 16 lb. detachable power head and dust bag for portable blowing or vacuuming. 10-gal. steel tank, 1 hp. AC-DC motor. 43″ maximum water lift. Complete unit weighs only 50 lbs. Easily portable. Wet or dry pickup; furnace, boiler, and chimney cleaning; blowing dust from motors, switchboards, electrical equipment.

EXPLOSION-PROOF VACUUM CLEANER U/L listed for safe wet or dry pickup where explosive gases, liquids, or dust are present (Class 1, Group D and Class 2, Group G hazardous locations). ⅞ hp enclosed motor. 62″ water lift. Aluminum tank holds 10 gallons wet or 1½ bushels dry material. Static-free bronze wool filter. Explosion-proof switch. All parts and accessories made of spark-resistant brass or aluminum.

ADD-A-TANK—Adapts any industrial vacuum cleaner for heavy volume pickup. Fits 30-gal. or smaller ash can or drum. For cleaning boiler flues, fire boxes, chimneys, milling machinery, grain elevator pits.

SELECTING MACHINE TO FIT FLOOR AREA

For economy and efficiency, here is a guide to selecting the proper size floor machine with respect to area.

MC-12 Brush Area is 113 sq. in.
MC-14 Brush Area is 154 sq. in.
MC-16 Brush Area is 201 sq. in.
MC-19 Brush Area is 283 sq. in.
MC-22 Brush Area is 380 sq. in.
MC-31 Area Covered 855 sq. in.

Floor Area 750 to 2,000 sq. ft.	Floor Area 2,000 to 5,000 sq. ft.	Floor Area 5,000 to 10,000 sq. ft.	Floor Area 10,000 to 20,000 sq. ft.	Floor Area 20,000 sq. ft. and over	Hallways, large unobstructed areas

MULTI-CLEAN TESTED AND PROVED FLOOR FINISHES

WATERPROOF WAX — Lasting beauty, longer wear for all type floors. Blend of Carnauba and finest synthetic resins is remarkably *dirt resistant.* Also resists blackmarking, scuffing; won't crack, chip, yellow with age. Available with 12, 15, 18% solids content; also in special anti-slip formula. Listed by U/L.

DEEP GLOW WAX — Economy priced, water resistant wax with 12% solids. Contains synthetic waxes and resins. Produces beautiful, self-polishing, high gloss finish with good anti-slip properties. Almost colorless. Easy to remove.

LIQUID SPIRIT WAX—For sealed surfaces. Cleans and waxes in one operation. Consists of vegetable and mineral waxes reinforced with special resins. Gives hard, flexible, easily-cleaned surface. Adds life and lustre to all floors except asphalt and rubber. Maroon, tile red, brown, green, gray, colorless.

BLUE BLAZES CLEANER with HCP—Concentrated non-ionic synthetic cleaner for all floors. Cleans completely in hard or soft, cold or hot water. Easy rinsing, no soap scum. Cleans with a minimum of scrubbing. Approved by Rubber Mfrs. Ass'n. Meets or exceeds Asphalt Tile Inst. specifications.

STAPH-TROLE ANTISEPTIC CLEANER 200:1 dilution of this powerful antiseptic cleaner destroys *Staphylococcus aureus,* most other bacteria. Special non-ionic detergent's wetting, penetrating action increases germicidal effect. Floors, walls resist recontamination, stay de-odorized because odor-forming bacteria are destroyed. No film or residue. Equally effective in hard or soft, cold or warm water.

SUPER SAFETY CLEANER with HCP—All purpose, synthetic-base, *anionic* cleaner lifts grime quickly, and holds it in suspension for easy removal. Safe for all floors. Cleans perfectly in hardest water. Dilutes 50 or 60:1 for general cleaning; 12 or 16:1 to remove wax.

WAX REMOVER — Safe for all floors. Cleans floor and removes wax buildups. Odorless, non-ionic, non-inflammable. Easy, quick, inexpensive to use. Contains powerful emulsifying agent that works in 10 to 15 minutes.

REMOVOIL—A solvent cleaner and degreaser. Makes oil-soaked floors look like new. Non-explosive, non-toxic. Removes rubber burns from gym floors. Degreases all kinds of metal and alloys. Protects against rust and corrosion. Easy to use, highly concentrated.

SEAL AND VARNISH STRIPPER—Removes finish from wood, concrete, terrazzo. Easy to apply. Lifts old finish in 30 to 40 minutes. Non-inflammable. Won't raise grain in wood or harm basic floor materials.

CONCRETE HARDENER AND ETCHER—Cleans, etches, hardens, dustproofs. Gives extra strength to concrete. Etches all surfaces evenly so seals give more coverage, adhere better, last longer.

NEO-DRY CONCRETE SEALER — (Rubber base). Beautifully colors concrete floor surfaces. Fast drying, easy to apply, prevents dusting and chipping. Highly resistant to alkali and other corrosive agents. Colors: tile red, brown, gray, light gray, green, white, black, natural. Listed by U/L.

CONCRETE PRESERVER—(Bakelite base). Provides tough, sanitary, colorful finish and longer life for new or old concrete. Prevents dusting. High resistance to abrasion, water, grease, oils, alkali and soap. Especially recommended where petroleum spillage occurs. Colors: maroon, tile red, brown, green, gray, light gray, natural. Listed by U/L as anti-slip.

KWIK-COLOR CONCRETE SEALER—Odorless, non-inflammable, easy to apply on old or new concrete. Dries in 20-30 minutes. Busy floors can be back in service 2 hours after etching, sealing, waxing. In *non-fading* tile red, light gray, and light green.

HI-POLAMUR FLOOR SEAL—Light-colored sealer made from newest polymer resins. Exceptionally hard, tough, durable, resistant to rubber burns. Outstanding abrasion resistance and good resistance to chemicals and solvents. Solids content is 30 %, yet viscosity is low and penetrating ability extremely good. Normally dries in 3 hrs. No objectionable odor.

POLI-MIRRO FLOOR FINISH—Light-colored, extremely durable finish mfd. from new polymer resins. 40% solids content provides high gloss, mirror-like, non-glare, anti-slip surface of great hardness and abrasion resistance. This extra hardness makes it especially easy to clean. Usually dries in 4 hrs.

PENETRATING SEALER — Polymerized for greater penetration and thorough sub-surface sealing of all wood floors. Protects against wear, moisture, dirt. Stands heavy traffic. Listed by U/L. Approved by Maple Flooring Mfrs. Ass'n.

GYM FINISH—Provides hard, durable, easy-to-clean, high gloss surface, impervious to rubber burns. Fast, non-slippery footing. Meets Maple Flooring Mfrs. Ass'n. specs. Listed anti-slip by U/L.

ASPHALT TILE PRESERVER—Penetrates and seals in one application. Preserves beauty of new tile, revives color and finish on old, faded floors. Resists grease, water, soaps, alkalies. Ready for traffic in 20 minutes. Listed by U/L.

SUPER FLOR-TREAT—Synthetic resin finish protects and seals all type floors. Dries to tough attractive finish in less than 1 hour. Use alone or as base for wax. Odorless, non-inflammable, non-yellowing. Listed by U/L, approved by Rubber Mfrs. Ass'n., meets or exceeds Asphalt Tile Inst. specifications.

TERRAZZO SEALER—One-coat application brings out natural beauty and vivid terrazzo colors. Long lasting. Seals the pores, prevents chipping, and corrosion. Resists water, acids, alkalies, soaps, grease and solvents. Anti-slip U/L listed.

TUFF-DRI FLOOR FINISH — Extra tough, fast-drying finish for wood, concrete, creosote block, or battleship linoleum floors in industrial plants, bakeries, textile mills, institutions, commercial bldgs. Withstands heavy foot and truck traffic. Phenolic resin and tung oil base. Easy to clean, maintain.

FLOOR DRESSING—Ideal mop treatment for all type floors. Cleans, polishes, *makes floor extremely resistant to rubber marking.* Use on all wood, terrazzo, and concrete floors; also on wax or treated linoleum, asphalt or rubber tile. U/L listed.

RUG SHAMPOO — Cleanses and beautifies rugs, carpets in one operation. Harmless as water to all fabrics. Drying time 3 to 6 hours. Choice of coconut oil base or synthetic base (SYNTHE-CLEAN).

UPHOLSTERY SHAMPOO (Synthetic base). Revives dull, faded fabric safely, speedily. Gives new life to furniture, tapestries, automobile upholstery, clothing. Cleans completely. Easy to use, needs no rinsing. Safe for all fabrics.

MULTI-CLEAN PRODUCTS, INC.

Dept. NS-1-90 • 2277 Ford Parkway • St. Paul 16, Minn.

For additional information, use postcard facing back cover.

Two-Part Publication Tells How To Write School Board Policies, Gives Samples Used in 600 Systems

REFERENCE MANUAL ON WRITTEN SCHOOL BOARD POLICIES. Prepared by the National School Boards Association-National Education Association Joint Committee. 1960. $35. N.S.B.A., 1940 Sheridan Rd., Evanston, Ill. Includes How To Develop Written Board Policies — A Guide to Procedures. Pp. 28.

As stressed by the 12 members of the joint committee, school policies cannot be copied from another school district, but must be tailored to the needs of the individual district. Nevertheless, this publication is an outstanding addition to the field of materials dealing with written board policies, representing the joint experiences of board members, administrators, teachers and professional education association personnel. Prior to publication the material was pretested in three Illinois school systems.

The reference manual has two parts. Part 1 consists of the procedural guide and an outline of hundreds of topics on which school board policies need to be developed. Topics are grouped under the following six major headings: board of education; educational philosophy; school organization and personnel; instruction; school-community relations, and business and operational procedures.

Part 2 of the manual presents hundreds of examples of written school board policies on a wide variety of topics, selected from more than 100 local school system manuals received at the N.S.B.A. office and from more than 500 such manuals available for study at the N.E.A. office. This portion of the binder will be supplemented for a two-year period as additional materials become available.

Aid for Revising Policies

The combined sections of the manual are intended to provide the tools needed by board members and administrators in developing or revising their written board policies. A long array of specific suggestions and general aids is offered to assist lay and professional educators in this process.

Increasingly, board members are recognizing the need to put their policies in writing and to organize them into a usable form. The findings, observations and recommendations conveniently organized in the binder form should be of value to school systems seeking help of this type, and should go far to stimulate interest in developing well planned and organized written policies.

Edited by Harold V. Webb

Co-chairmen of the joint committee — made up of school board members, administrators, teachers and professional education association personnel — were Mrs. Fred Radke and John Lester Buford. Harold V. Webb, associate executive director of N.S.B.A., had the major responsibility for the editing and production. ■

He's Out. The first graduating class of a Bronx (New York City) junior high school was delighted when Russian Premier Nikita Khrushchev accepted its invitation to contribute to the school's yearbook. But now the editors of the *Sousa Blue and Gold* have informed Mr. K that they will not publish his letter "because, in the light of your recent insults to our country and our President, we must doubt its sincerity." Instead they have published their note to the Russian leader. It ends: "You state in your letter that you want peace for all the children of the world, a sentiment that we share. But, Mr. Premier, we have a saying that probably has a Russian equivalent: 'Actions speak louder than words.'"

How **DUDLEY** gives you the best in Combination Locker Locks

RD-2
Rotating Dial Combination Padlock
Solid stainless steel case, revolving dial with 64,000 possible 3-number combinations. Self-locking when shackle is pushed home.

Master-Chart Control

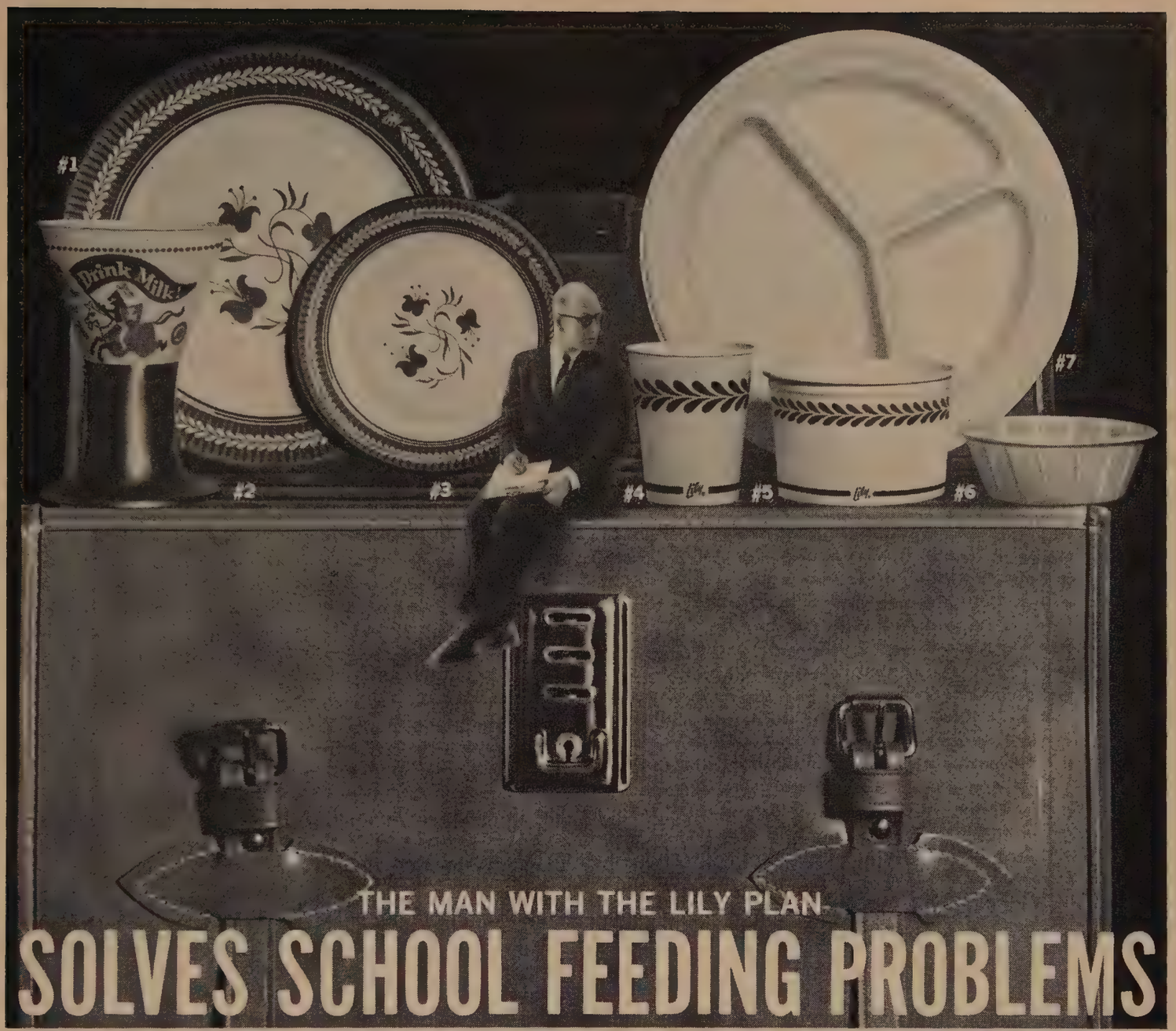
RP-5
Combination Padlock with Revolving Knob Pointer
Solid brass case . . . 40-division dial marked in white on black enamel . . . self-locking—when hasp is pushed home tumblers turn, pointer spins away from last combination number.

A complete installation of school locker locks like those shown here is controlled with the utmost simplicity by the proper authorities.

The Master Chart identifies each lock by number and gives its correct combination. No matter how much changing of locks there might be at semester's end or by swapping among pupils at any time, there is no trouble at all in identifying any lock with its combination, yet with controlled safety. No unauthorized person need have access to the Master Chart.

This simple control is only one of the many reasons that have made Dudley Locks the long time favorite among everyone connected with schools everywhere.

DUDLEY LOCK CORPORATION
1436 Old Dixie Highway, Vero Beach, Fla.
The standard of controlled locker protection since 1921



THE MAN WITH THE LILY PLAN

SOLVES SCHOOL FEEDING PROBLEMS

Lily food service is seven ways better

Individually, or in complete place settings, Lily* food service gives you all these benefits.

Ends sanitation problems—No chance of sanitation slip-ups here!

Controls portions and food costs—Lily has the right size cup, container, dish or plate for every need.

Eliminates washing and bussing—After use, they're thrown away. No more expensive machinery and labor needed to wash or buss. Speeds clean-up time too!

Ends breakage—accidents—Lily paper service is safer for children . . . economical for you!

Saves storage space and handling—Stacks easier, more compactly than chinaware...about 30 times lighter, too!

Cuts out noise — None of the rattle or clatter of other types of service. Makes eating more pleasant for everyone!

Ideal for central kitchens—Paper service can be inventoried "on location" to end transportation to individual schools! Saves washing, storage!

Here are the facts on a few of the popular Lily food service products (shown above, left to right) used in school lunchrooms across the country.

#1. 9-in Green Leaf Design Plate, plastic-coated. For all entrees.

#2. 10-oz. Milk Design Cup (to be used with cup holder). Ideal for serving milk from refrigerated bulk dispensers.

#3. 6-in. Green Leaf Design Plate for bread, pie, cake.

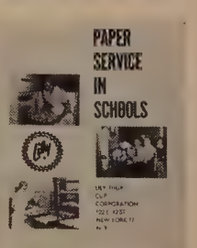
#4. 5-oz. Cold Cup for juices.

#5. 8-oz. Hot Food Container for soups, stews, casseroles. (You can bake and serve right in these Lily unwaxed Nestrites.*)

#6. 4-oz. Pleated Dish for salads and desserts.

#7. 9¼-in. Molded Compartment Plate. For all entrees.

FREE! Lily is now offering an informative and educational booklet entitled "Paper Service in Schools." If you would like a copy, just send this coupon.



LILY-TULIP
*T.M. REG. U. S. PAT. OFF.

LILY-TULIP CUP CORPORATION
Dept. NS960
122 EAST 42ND STREET, NEW YORK 17, N. Y.

PLEASE SEND ME "PAPER SERVICE IN SCHOOLS."

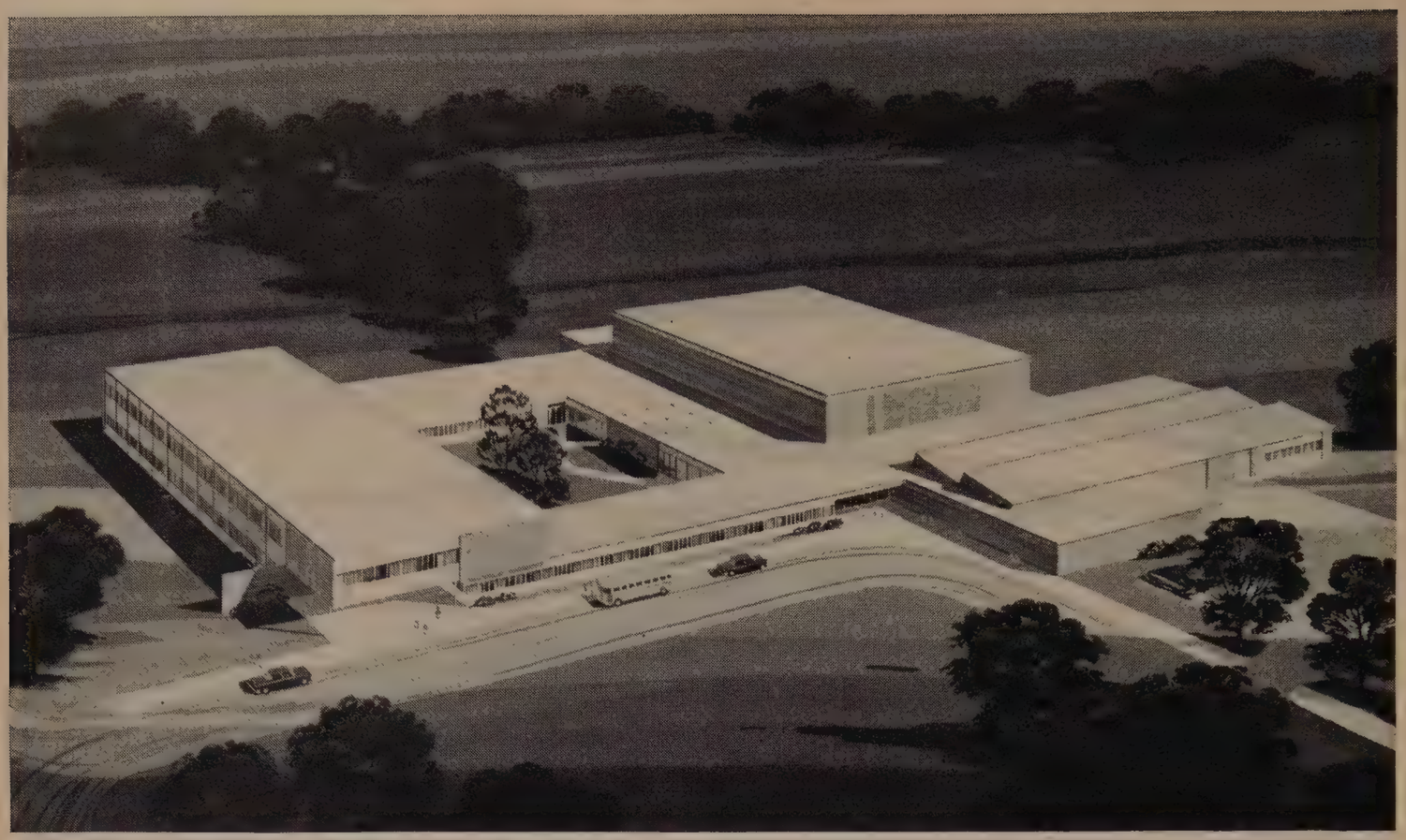
NAME_____

INSTITUTION_____

STREET_____

CITY_____ ZONE____ STATE_____

For additional information, use postcard facing back cover.



In the new Batavia Senior High School, Batavia, New York...

NEW CARRIER HEATING AND VENTILATING SYSTEM PROVIDES 9 MAJOR ADVANTAGES YET COSTS LESS

This modern high school offers an excellent example of how any new school can enjoy a superior heating and ventilating system at less than the cost of ordinary unit ventilators. And this new kind of system is ready for immediate conversion to year-round air conditioning with the simple addition of packaged refrigeration equipment in the machine room.

In planning Batavia Senior High, the architects considered unit ventilators and several popular central station systems. They carefully compared the performance characteristics, maintenance requirements, first cost and operating cost of each method. Their conclusion: The new Carrier 37E All-Air Weathermaster* System provides the highest quality automatic heating and ventilation currently available to schools. It is the easiest to convert to complete year-round air conditioning. It costs 10% less, installed, than the next best method. And it costs less to operate and to maintain than other automatic systems.

The nine important advantages of the 37E Weathermaster System which led to these conclusions are listed on the opposite page. They are unique because Carrier 37E units are the only room terminals which combine the performance benefits of the induction principle with either high or low velocity air distribution and the superiorities inherent in all central station systems.

If you are planning a new school, it should be well worth your while to look into the Carrier 37E All-Air Weathermaster System—either for heating and ventilation only, or with an eye to future air conditioning. The nearby Carrier office will be glad to give you, your architect and consulting engineer complete facts on the system. Or you may write to Carrier Air Conditioning Company, Syracuse 1, N. Y.

*Reg. U.S. Pat. Off.

Batavia Senior High School has classroom space for 850 pupils and auxiliary facilities for over 1000. Building includes 36 classrooms, art rooms, science rooms, homemaking suites, music rooms and vocational shops. Each academic department has a conference room. Also provided are administration offices, health and guidance facilities, and student activities center. Two-station gymnasium provides bleachers to seat 1200. Boys' and girls' locker facilities also include a team room. Two cafeterias and a teachers' dining room are separated by a large kitchen. The auditorium seats 950. Dimensions: area—109,644 sq. ft.; cubage—1,856,000 cu. ft. ***Architects:*** **Sargent, Webster, Crenshaw & Folley, A.I.A., Syracuse, N.Y.**

Only the Carrier 37E All-Air Weathermaster System offers these 9 advantages for heating and ventilating

1 Positive ventilation and air circulation under all conditions and seasons for improved odor dilution. Constant air volume from units.

2 Quieter operation—no fans or other moving equipment in classrooms, with all powered equipment located in machine room for easy servicing.

3 Superior air filtering at central station—minimum filter maintenance.

4 No costly wall openings, subject to rain and wind leakage, required in classrooms for ventilation air.

5 No operation of fans required for night and week-end heating, with gravity heating handling the load.

6 Individual temperature control in every room solves zoning problems; air damper assures easy initial system balancing, requires no adjustments thereafter.

7 Valuable classroom floor and wall space is saved by the compact units; cabinet only eight inches deep.

8 Remarkable new Carrier Air Purifier may be included in central system for automatic filtration, automatically regenerated odor absorber and winter humidification.

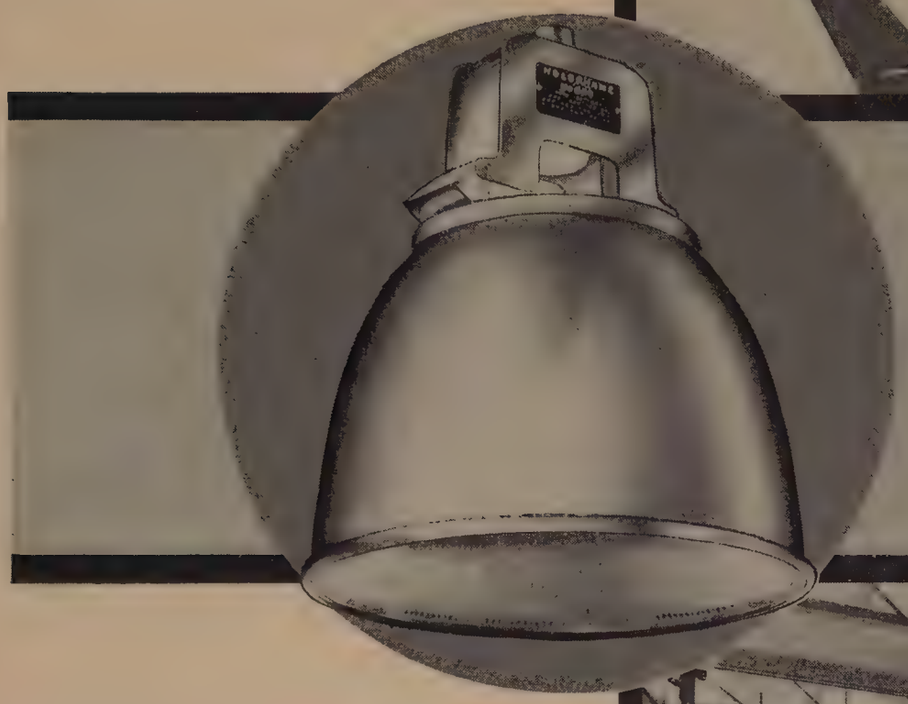
9 Easily and economically converts to full-year-round air conditioning at any future date with simple addition of packaged water chilling machine in central apparatus room. No revision of classroom units, controls or air ducts required. Condensate drains not needed. Nominal conversion cost about 65c per sq. ft., or less.

MORE PROOF OF
BETTER AIR CONDITIONING FOR EVERYBODY *EVERYWHERE*
Carrier

HOLOPHANE

Recognized Leaders in Better Lighting for Better Education

Colorado School of Mines
Golden, Colorado
Archts.-Engrs.: Fuller, Fuller & Fuller



No. 635 LOBAY® Reflector
for 400 Watt Mercury Vapor Lamps

Wm. Diamond Junior H.S.
Lexington, Mass. Archt.: Charles H. Cole
Cons. Engrs.: Cleverdon, Varney & Pike

Because so much in effective instruction, visual comfort and student safety depends on efficient illumination—school authorities select HOLOPHANE prismatically-controlled luminaires for every phase of educational activity... Holophane provides the best illumination for gymnasiums. Light sources are deep-shielded, eliminating glare. Reflector surfaces are kept clean by upward draft... Investigate how *quality lighting* with prismatic control—traditional with Holophane—can mean sustained advances in education—with definite reductions in costs. Write for data.

HOLOPHANE
COMPANY, INC. • *Lighting Authorities Since 1898*
342 Madison Ave., New York 17, N. Y.
THE HOLOPHANE CO., LTD., 418 KIPLING AVE. SO., TORONTO 18, ONT.

Edited by BESSIE COVERT

WHAT'S NEW for Schools

TO HELP YOU get more information quickly on the new products described in this section, we have provided the convenient Readers Service Form on page 215. Check the numbers on the card which correspond with the numbers at the close of each descriptive item in which you are interested. The NATION'S SCHOOLS will send your requests to the manufacturers. If you wish other product information, just write us and we shall make every effort to supply it.

Edwards Language Laboratory Console Broadcasts Up To Four Lessons

Features of Edwards new and simplified language laboratory system include flexible multi-channel programming and elimination of mass tape duplication and bulk erasing. The instructor's master console, the nerve center of the system, houses lesson channel controls, student selector switches, amplifiers and tape playbacks in a single compact unit with uncomplicated knobs and keys which make operation simple. Up to four separate lessons can be channeled to any desired combination of student booths. Greater program flexibility is possible as individual students can work independently with advanced or remedial material and still be under the teacher's control. Dual-track tape recording and playback equipment are used throughout the system, the lesson material transcribed on the "lesson" track, which cannot be erased but can be used indefinitely, and the pupil responses on the erasable "practice" track which permits the student to correct his own errors instead of repeating them. **Edwards Co., Inc., Educational Equipment Div., 92 Connecticut Ave., Norwalk, Conn.**

For more details circle #450 on mailing card.

Geocoustic Cellular Glass "Patches" Effectively Sound Condition

Individual units of acoustical cellular glass are used for effective sound conditioning in the new Geocoustic system. The open-celled cellular glass material has unusual properties, including rigidity and dimensional stability that permit precision engineering. Small holes of precise dimensions can be made to predetermined depths, permitting the production of absorption units that may be "tuned" to specific frequencies, so that effective sound conditioning is achieved through "patch" installations.

The illustration shows Geocoustic cellular glass units mounted on the upper part of the walls of a cafeteria, making full use of the Geocoustic function of sound absorption, diffusion and control. The high absorption efficiency of Geocoustic makes it possible to achieve desired acoustical results with smaller and fewer patches

than were previously necessary, reducing costs and resulting in attractive designs. The product is marketed in 13½ inch squares, 2½ inches thick. Nearly 2400 holes are pressed into both the front and back surfaces and the unit is mounted on four square pads a half-inch thick, creating the effect of a resonant chamber. **Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.**

For more details circle #451 on mailing card.

Office Machine Cabinet Has Adjustable Shelf

Single section sorting files for additional storage of paper and forms may be attached on one or both sides of the new Lyon office machine cabinet. The right size for use with most office reproduction equipment and other types of machines, the cabinet has an adjustable shelf and built-in lock for safely storing supplies, and the pan-type sliding tray mounted under the top may be inverted for use as additional working space. The unit, designed to match other Lyon office furniture, is 27 by 21 by 29 inches and is finished in gray baked-on enamel. **Lyon Metal Products, Inc., 3 Plant Ave., Aurora, Ill.**

For more details circle #452 on mailing card.

(Continued on page 190)

UPDATE YOUR WASHROOMS–
LOWER YOUR MAINTENANCE COSTS
with these school-service-designed

BOBRICK SOAP DISPENSERS

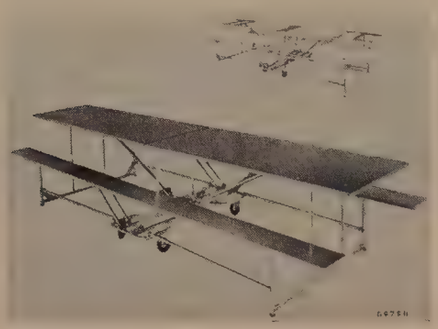
• If your washrooms need new soap dispensers, you're paying for them now! It's a fact that maintenance costs of servicing outdated equipment often are higher than the cost of new equipment.

BOBRICK DISPENSERS, INC.
"Dependable Dispensers since 1906"
1214 NOSTRAND AVE., BROOKLYN 25, N. Y. • 1839 BLAKE AVE., LOS ANGELES 39, CALIF.

BOBRICK DISPENSERS, INC., DEPT. N, 1214 NOSTRAND AVENUE, BROOKLYN 25, NEW YORK
Gentlemen: Please send me your free booklet explaining *how a major school system reduced its maintenance costs by 50% with Bobrick Soap Dispensers.*
Name_____ Title_____
School_____
Street Address_____
City_____ Zone____ State_____

Uniframe Roll-Away Tables Have Solid Welded Understructures

Extra table strength is achieved with unit-frame construction, a feature of the



Uniframe roll-away type folding lunch table. The solid welded understructure completely supports table and bench tops, preventing them from sagging or warping or from swaying or shaking when in use, and locks automatically to eliminate surprise closings and table tipping. Easy walk-in is permitted with the new design and the under table area is virtually free of obstructions. The table rolls on four-inch rubber tired casters, is simple and safe to operate, and opens and closes in a single motion. **Smith System Mfg. Co., 212 Ontario St., Minneapolis 14, Minn.**

For more details circle #453 on mailing card.

Liquid Form Bingo Easy to Handle

Packed in a non-breakable, re-usable plastic bottle, Liquid Bingo Drain Pipe Opener provides safety and speed, quickly dislodging slime, grease, hair, coffee grounds and other materials from pipes and plumbing fixtures without damaging glass, metal or porcelain, when used as directed. Bingo in its new liquid form is both effective and easy to handle. **Huntington Laboratories, Inc., Huntington, Ind.**

For more details circle #454 on mailing card.

Series 60 Folding Chairs Priced for Low Budgets

Priced for institutions with very low budgets, the new Krueger line of Tubular Steel Folding Chairs, Series 60, is designed to provide quality portable seating at low unit costs. The economical chairs

open and close easily and noiselessly, are styled in a non-collapsing X-Type design and are available in models with steel, Masonite recessed panel or upholstered seats. **Krueger Metal Products Co., Box 1097, Green Bay, Wis.**

For more details circle #455 on mailing card.

Increased Student Safety With Hull Exit Signs

Potential hazards are protected against and fire safety increased with the new Hull Exit sign category, available with 16 different wordings. The signs are of use for present buildings and for temporary, off-premise overflow classrooms and make-shift dormitories. **Hull Sign Co., West Winfield, N.Y.**

For more details circle #456 on mailing card.

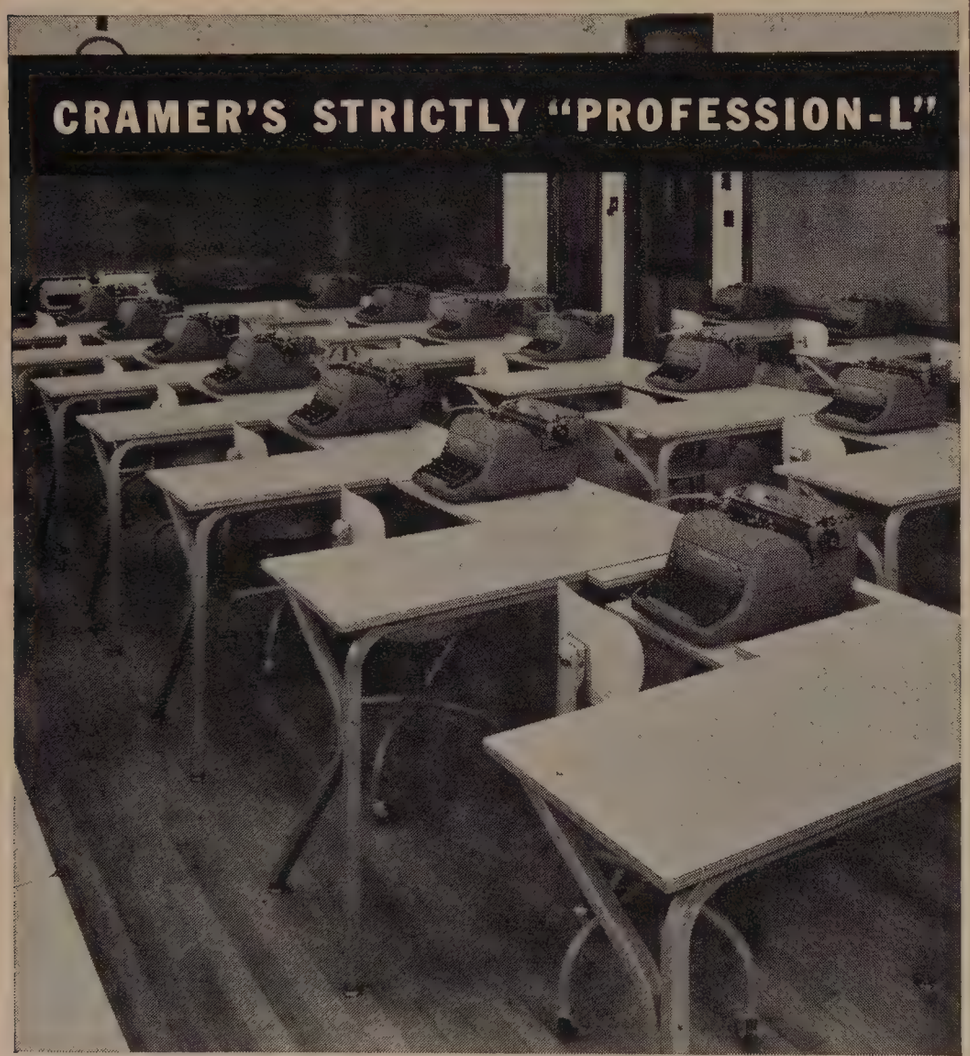
Doric Lettering Set Has Three Letter Sizes

A deluxe edition of the Doric lettering set is now available for use wherever lettering is done. The Doric 8935 contains a template with three sizes of capital and

lower case letters and numerals and the adjustable scribe produces slanted and vertical letters. The set is designed for teaching as well as professional use in libraries, drafting classes, for motion picture slides and many other purposes. The set also includes two pens in different line widths, a lead holder for pencil work, scribe, ink in a cartridge and straightedge, all in a sturdy case. **Keuffel & Esser Co., Adams & Third Sts., Hoboken, N.J.**

For more details circle #457 on mailing card.

(Continued on page 192)



Place your students in the authentic office atmosphere of Cramer Profession-L Laboratory Furniture and watch them learn faster. With Cramer's sleekly trim modular combinations, your classroom becomes an office where business training is easier—economical, too.

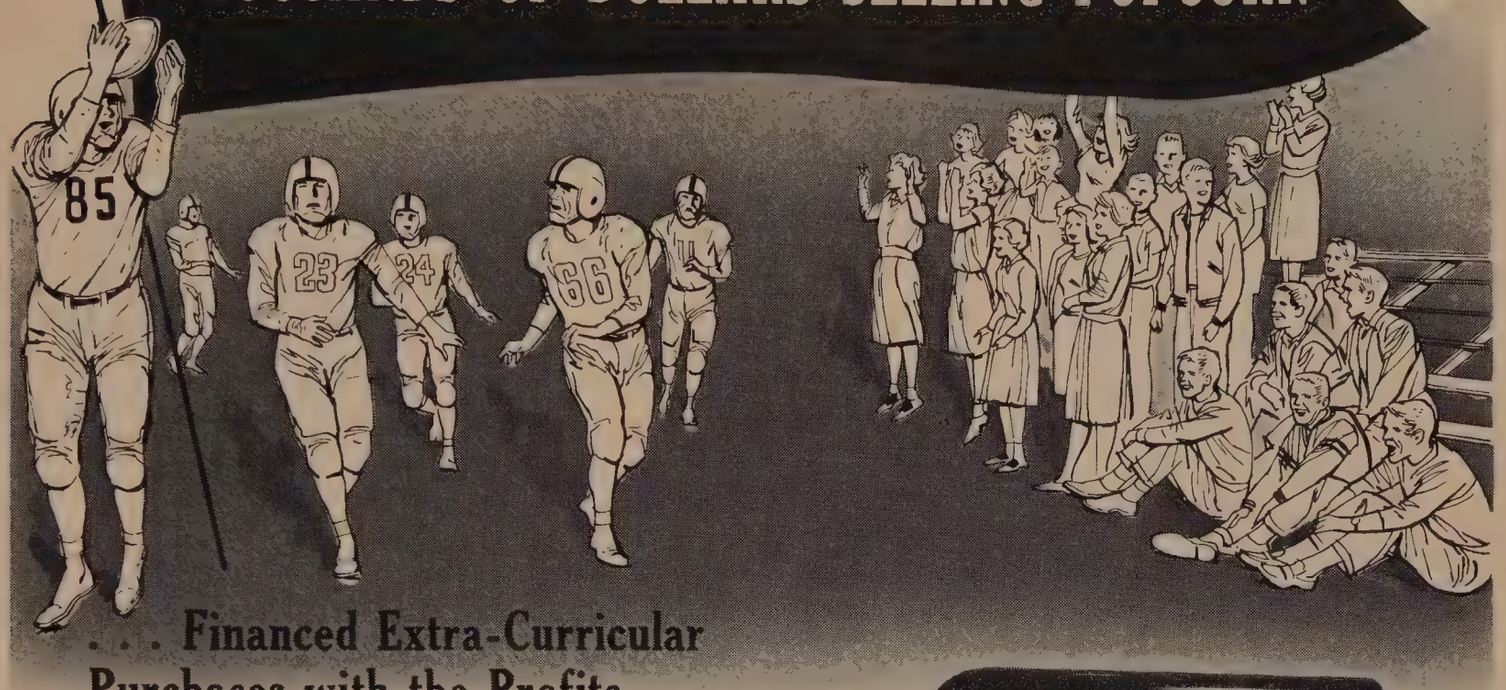
Cramer saves space: 7 basic free-standing units, plus 3 auxiliary units, combine to make hundreds of practical units. You can teach Typing, Shorthand, Bookkeeping, Machine Practice and General Business in one classroom.

WRITE FOR COMPLETE DETAILS

Cramer saves cost: Engineered and constructed to last many years with practically no maintenance. Plastic tops. Units will not "walk" from vibration.

Cramer POSTURE CHAIR COMPANY, INC.
625 ADAMS / DEPT. NS-9 / KANSAS CITY 5, KANSAS

OVER 5,000 SCHOOLS HAVE MADE THOUSANDS OF DOLLARS SELLING POPCORN



. . . Financed Extra-Curricular Purchases with the Profits

Small schools, medium size schools, large schools, across the nation, have found the solution to obtaining much wanted items not included in the school budget.
They have purchased a Manley VISTAPOP® popcorn machine, or similar model, and sold popcorn at school events and functions. Profits of 8c on a 10c bag of popcorn mount up quickly. Soon there is enough profit money to buy those items they've always wanted—band uniforms . . . sports equipment . . . motion picture projectors . . . hi-fi phonographs and many others.

Here's What Schools Say About Popcorn Profits

"We are happy to report that the machine not only paid for itself during the school year, but gave us a substantial profit. The demand for popcorn at our football games has been so great that we have purchased a second machine during this current football season."
—Delano Joint Union High School, Delano, Calif.

"Our Senior Class has just returned from Washington, D. C. This is the second Senior Class to make the trip. It was made possible by the profits from our Manley Popcorn Machine."
—Dawson Bryan Board of Education, Coal Grove, Ohio

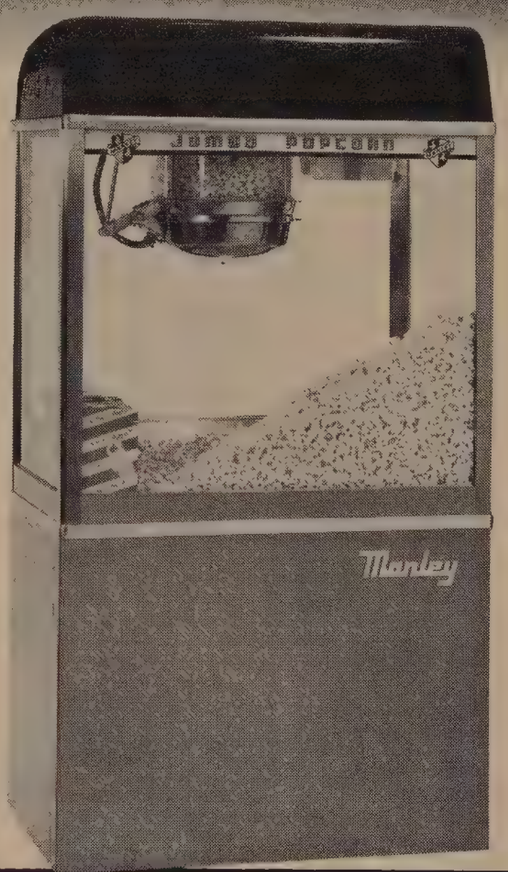
"Our popcorn sales are approximately $30 daily. This increase in store sales enabled us to sponsor a driver training program successfully without charge to the students."
—Williams Township School, Whiteville, N. C.

EASY TO OPERATE. The Manley Vistapop is so easy to operate that students are running it after only 10 minutes' instruction.

SELLS AT ALL TYPES OF SCHOOL FUNCTIONS. Football, basketball and baseball games. Class parties and school carnivals. Lunchroom and after school gatherings.

MACHINE PAYS FOR ITSELF. Many schools finance its purchase through the P. T. A. or similar organizations — repay the cost of the machine quickly with the profits from sales.

WRITE FOR DETAILS. Mail the coupon below to receive full information on how the Manley Vistapop can work profitably for your school.



MANLEY, INC.

1920 Wyandotte St. Kansas City, Mo.

MANLEY, INC. Dept. NS 960
1920 Wyandotte St.
Kansas City 8, Mo.

☐ Please send me, without obligation or charge, information on the Vistapop for our school.

☐ Please have a representative call.

Name_____ Title_____

School_____

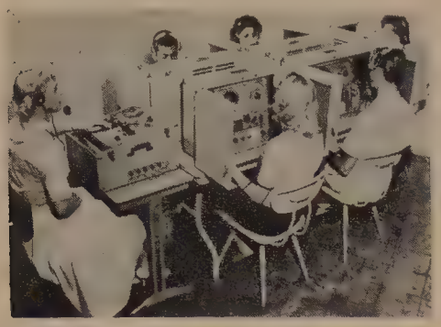
Address_____

City_____ Zone_____ State_____

Portable Language Laboratory Accommodates Up To 10 Students

A new system that makes full use of confined space and limited budgets, the Model 75-TA, with output jacks to accommodate up to 10 Solitaire Tape Recorders, Model 72-T, in a "master-slave" combination. For individual use by the student, the Solitaire is a dual channel recorder mounted in a booth-type portable carrying case lined with polyurethane sound proofing. **Rheem Califone Corp., 1020 N. La Brea Ave., Hollywood 38, Calif.**

For more details circle #458 on mailing card.



Rheem Califone portable language laboratory consists of a Master Tape Recorder,

Graham Cracker Crumbs In 25-Pound Bag

Over 60 Graham crumb pies can be made from the new 25-pound sized bag of Nabisco Graham cracker crumbs for institutional use. The crumbs are of high quality crackers uniformly crumbled and are packed in a multi-wall, polyethylene-lined bag for maximum protection. A variety of dessert ideas is available from Nabisco's test kitchens. **National Biscuit Co., 425 Park Ave., New York 22.**

For more details circle #459 on mailing card.

International Model 193-RE Is Large Capacity Bus

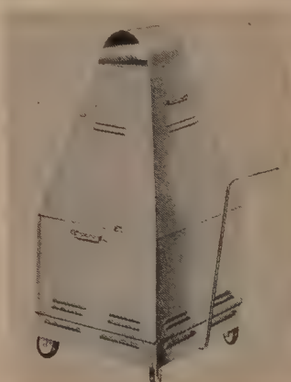
With a 61 to 73 passenger capacity, the new Model 193-RE pusher type schoolbus is designed for high mileage or heavy traffic and emphasizes safety of operation.

The rear engine mounted chassis is developed for larger capacity with maximum maneuverability and driver visibility, and its advantages include more positive traction from its V-8 engine, virtual elimination of engine noise and fumes, and an unhampered front aisle entrance and driver's compartment. Heavy-duty components of the bus are all of ample capacity to move full passenger loads with heavy traffic in congested areas, and a choice of optional parts is available to meet specific operating requirements. **International Harvester Co., 180 N. Michigan Ave., Chicago 1.**

For more details circle #460 on mailing card.

Incinerator-Trash Holder Is Low-Cost Mobile Unit

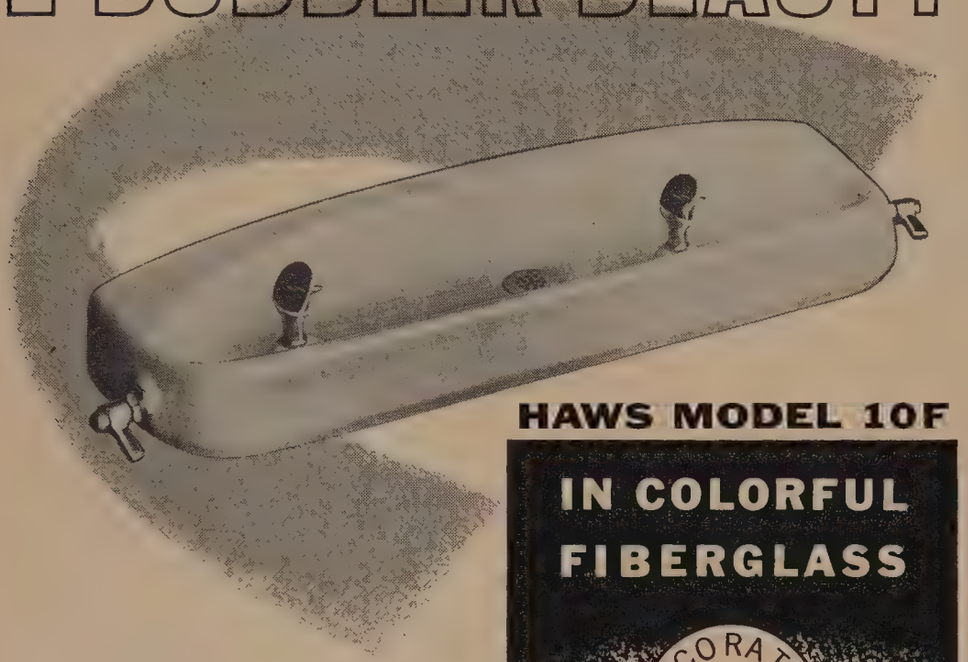
Wheels and a pull handle make the low-cost combination Model F6W incinerator-trash receptacle a versatile addition to cleaning equipment. It can be used inside or outside a building to collect burnable trash of all kinds, then



wheeled to an outside area where the trash can be burned safely within ten feet of the building with minimum smoke and smell and no supervision. Trash burns to a fine ash in any weather as the scientific draft control ensures burning even damp or green refuse. Constructed of rust resistant aluminized steel, the incinerator-trash receptacle has six-inch wheels, the front wheels swiveling to make it easy to handle in collecting trash and in moving it to the burning area. **The Alsto Co., 4007 Detroit Ave., Cleveland 13, Ohio.**

For more details circle #461 on mailing card.

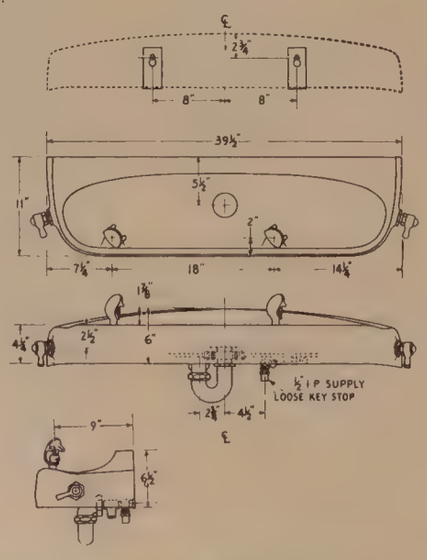
2 BUBBLER BEAUTY



HAWS MODEL 10F

IN COLORFUL FIBERGLASS

DECORATOR 5 COLORS



An accent of color with the graceful sweep of clean design—that's the new HAWS 2-bubbler Model 10F! Patterned after the popular Model 10Y (3-bubbler fiberglass model), this tough, vacuum molded fiberglass plastic unit is equipped with HAWS exclusive anti-squirt, vandal proof fountain heads. All visible trim is chrome plated. Select white or any of *five* decorator colors at no extra cost.

•

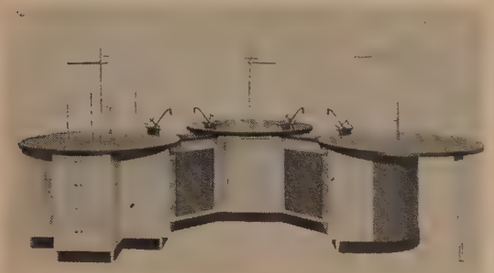
For details on HAWS' full line, write for the latest catalog—or check your Sweets File.

HAWS DRINKING FOUNTAINS

Products of HAWS DRINKING FAUCET COMPANY
1441 Fourth Street, Berkeley 10, California
Export Dept.: 19 Columbus Ave., San Francisco 11, California

"Science Circle" Furniture Provides Maximum Work Space

High quality construction at a price to fit the average school budget is combined with maximum work space in the new Sjostrom "Science Circle" furniture for science departments. The new design features circular tops, a choice of several storage bases, and inter-connecting sinks. The illustration shows three different base units, picturing the types available, and will accommodate twelve students, four at each table. Various other formations can



be made to conform to requirements, one connector sink being used with two work tables in every case. Cost is thus kept down while quality remains high. Services include stainless steel sink bowls, cold water faucets, gas cocks and duplex electrical outlets. **John E. Sjostrom Co., 1717 N. 10th St., Philadelphia 22, Pa.**

For more details circle #462 on mailing card.

Heavy-Duty Stair Treads in Two Colors

Beige and Walnut are the two new colors immediately available in Musson No. 500 and No. 1000 heavy-duty rubber stair treads and matching landing tile. Both tones are adaptable with many color combinations and are marbleized in the rubber, making them decorative and easy to keep clean. **R. C. Musson Rubber Co., 1620 Archwood Ave., Akron 6, Ohio.**

For more details circle #463 on mailing card.

Portable Science Unit Complete in Birch Cabinet

Versatility and functional use are offered in limited space with the new Model

TPSU-100 Portable Science Unit for elementary and advanced classes. Completely built in a 24 by 48-inch birch cabinet with a plastic top working area, the unit is equipped with ¾ inch duralumin rods, a stainless steel sink, pressure faucet pump, propane burner, fuel tank, three tote trays, two polyethylene bottles with tygon hose connections, and a three-pronged electrical duplex receptacle with rubber-covered extension cord. **Tolerton Co., Alliance, Ohio.**

For more details circle #464 on mailing card.

(Continued on page 194)

Two more reasons why your best buy is better than ever: *Every Student Microscope should have these features. Most have neither... only the Bausch & Lomb Standard Teaching Microscope has both:*

NEW LIFETIME BALL-BEARING FOCUS The slide floats on ball bearings to assure perfect smoothness . . . the most wear-free focusing in any student microscope.

NEW FORCE-PROOF CLUTCH Prevents damage to fine adjustment mechanism and specimens. Students *can't* damage focusing assembly by forcing the fine focus knob.

BAUSCH & LOMB STANDARD TEACHING MICROSCOPE

You'll get extra *years* of service from the B&L ST Microscope . . . it's student-proof to stand up under the hardest classroom use.

And the ST Microscope is hands down the finest instrument in the school budget range. It's standard size, with standard operation and laboratory grade optics.

Made in America to the world's highest standards. Lifetime warranty; service everywhere by qualified B&L dealers. Meets C.C.S.S.O. Purchase Guide Requirements, Nos. 2625, 2645, and 2650. Only $112.50 in lots of 5.

BAUSCH & LOMB

BAUSCH & LOMB INCORPORATED
68909 Bausch St., Rochester 2, N. Y.

☐ Please send Catalog D-1079.

☐ I'd like a demonstration of B&L Standard Teaching Microscopes.

NAME .....

TITLE .....

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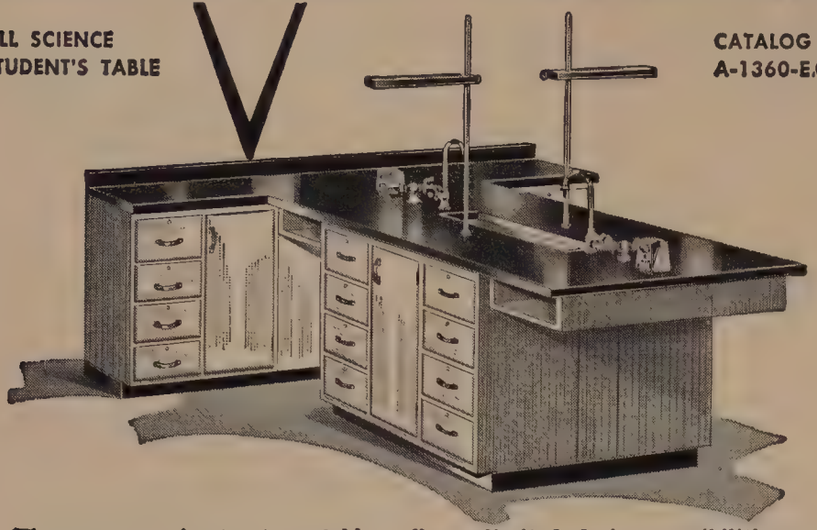
Quality / FURNITURE for all SCIENCE LABORATORIES

ALL SCIENCE STUDENT'S TABLE

CATALOG NO. A-1360-E.C

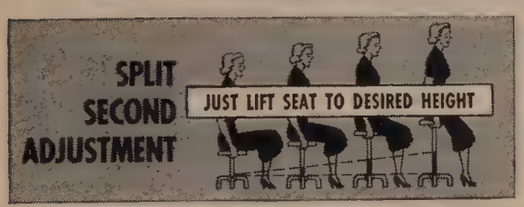


These new perimeter type tables offer unlimited design possibilities and arrangements from standard interchangeable base units. They provide numerous advantages for new construction design as well as for use in remodeling for Chemistry, Physics, Biology and General Science laboratories. Our representative engineer will be pleased to discuss your requirements and show you the entire line of Peterson furniture that has been the choice of leading educators and industrial furniture users for more than 65 years.

Write Dept. 1226 for Brochure Number 12. It's Free.

LEONARD PETERSON & CO., INC.
1222 FULLERTON AVENUE, CHICAGO 14, ILLINOIS

AJUSTRITE® CHAIRS AND STOOLS



- Proper classroom posture
- No soiled hands when adjusting seat
- Child can adjust seat—it's so simple

AJUSTRITE TYPING CHAIRS

Model TSC-1520 Typing Chair and Model 2228 Table
Adjust the chair, not the table, and save on your original investment. Saddle shaped hardwood seat adjusts from 16″ to 21″. Form fitting backrest (metal or plywood) has vertical and horizontal adjustments of 5″.

Model CPC-1520 Typing Chair
Form fitting plywood seat adjusts from 15″ to 20″. Form fitting plywood backrest adjusts 5″ vertically and horizontally.

FREE TRIAL Use an AJUSTRITE chair and table for 30 days without obligation. Prove to yourself the many advantages AJUSTRITE offers in comfort, utility and economy. Write today—we'll do the rest.

10 YEAR GUARANTEE

32 Models for Factories • Schools • Laboratories • Hospitals • Offices

AJUSTO EQUIPMENT CO.
515 CONNEAUT ST. · BOWLING GREEN, OHIO

Draft Barrier Storage Cabinets Give Storage Space and Heating

With Chromalox Electric Baseboard mounted behind the Draft Barrier Storage Cabinets, the new units provide concealed perimeter heating as well as abundant storage space and may be used as independent room heaters or with the Chroma-

lox Unit Ventilator. The cabinet base and top grille are perforated to allow air circulation to the baseboard heaters, cool air entering through the cabinet base where it is heated and rising upward through the top grille, counteracting downdrafts. Of 16-gauge steel factory finished in baked-on Coral-Tan enamel, the cabinets have adjustable shelves, are available in two, three and four-foot lengths, and may be joined together to form longer lengths for full wall coverage. **Edwin L. Wiegand Co., 7500 Thomas Blvd., Pittsburgh 8, Pa.**

For more details circle #465 on mailing card.

Vinyl Clad "PX" Cloth Withstands Rough Handling of Books

Vinyl clad "PX" cloth is a new book binding material developed by Du Pont. It incorporates vinyl impregnated book cloth, a specially formulated primer coat and a clear protective film designed specifically for use on book covers. The resulting material is durable and will retain lithographed cover designs for extended periods despite constant handling and rough treatment. **E. I. du Pont de Nemours & Co., Wilmington, Del.**

For more details circle #466 on mailing card.

Instrument Case Features Plug-In Chassis

A half-turn of the convenient Serv-A-Unit cam lock quickly locks in or removes

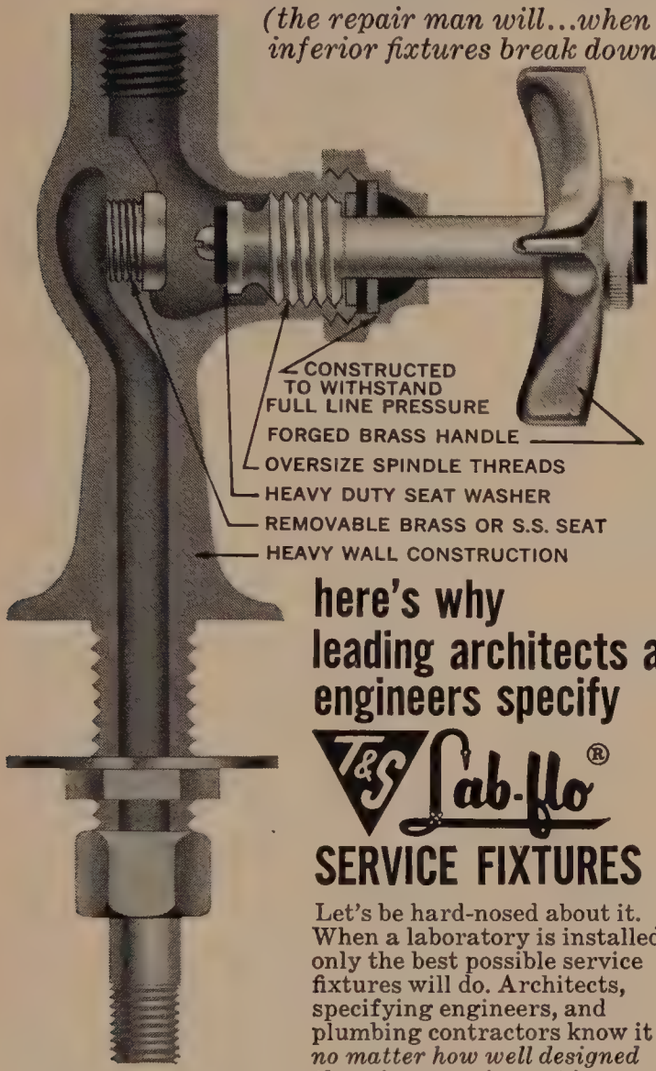
the plug-in chassis of the Alden off-the-shelf instrument case, designed for use as a standard case for test instruments or as a carrying and shipping case for a plug-in replacement chassis. The unit is of rugged steel construction with a baked enamel finish and functional hooded styling that protects lights, dials and switches. **Alden Products Co., 117 Main St., Brockton, Mass.**

For more details circle #467 on mailing card.

(Continued on page 196)

LOOK "UNDER THE HOOD"
of LABORATORY SERVICE FIXTURES

(the repair man will...when inferior fixtures break down)


CONSTRUCTED TO WITHSTAND FULL LINE PRESSURE
FORGED BRASS HANDLE
OVERSIZE SPINDLE THREADS
HEAVY DUTY SEAT WASHER
REMOVABLE BRASS OR S.S. SEAT
HEAVY WALL CONSTRUCTION

here's why leading architects and engineers specify

T&S Lab-flo®

SERVICE FIXTURES

Let's be hard-nosed about it. When a laboratory is installed, only the best possible service fixtures will do. Architects, specifying engineers, and plumbing contractors know it *no matter how well designed the science equipment is, it will operate only as well as its fixtures.*

It's a fact that there are important differences in fixtures used for laboratory furniture and it takes such experts to recognize them—even the busy repair man on his frequent trips to replace ordinary washers, re-grind worn seats, or to install whole new units because of stripped threads. That is why T&S Lab-Flo Service Fixtures, **heavy duty engineered and constructed throughout especially for laboratory use,** are preferred for wood or metal installations of any size or design. Lab-Flo is built for strength, safety, and ease of handling in the laboratory. No thin walls or shallow threads to break down, no weak parts to give out when full line pressure is applied. Look at a cross-section of a Lab-Flo fixture and you will see a cross-section of quality at its finest. You pay for quality—why not get it? You will...when you specify Lab-Flo right down the line on your next laboratory installation, new or remodeled.

THOSE IN THE KNOW SPECIFY **Lab-flo**

See your **Lab-flo** dealer or write for Catalog

SERVICE FIXTURES • HOSE COCKS
REMOTE CONTROLS • RECEPTACLES

Refer to 1960 Sweet's Catalog, Code: 27b / Ta

T & S BRASS AND BRONZE WORKS, INC.
128 MAGNOLIA AVE., WESTBURY, L.I., N.Y.
Telephone: EDgewood 4-5104

FOR THE BEST JOB

with the *Best Equipment...* use the GREEN LABEL LINE

No, nothing else . . . because no other line of floor cleaning equipment is so complete . . . so right for every job of floor cleaning. Advanced design and superior construction make The Green Label Line best . . . and best for YOU! The *SQUEEZE-EASY* Mop Wringer takes ALL mops — from 12 through 32 ounces! *Measurite* Graduated Buckets are the ONLY buckets with permanently embossed, easy-to-see gallon graduations! You SEE what you're doing . . . save time, money, effort. The *POLY-DOLLY* Bucket Truck is unique because it's ADJUSTABLE . . . to accommodate any shape or size buckets from 16 through 44 quart capacity. Yes, because this family of floor maintenance equipment does a better cleaning job you need nothing else!

***SQUEEZE-EASY*... 7 Exclusive Features**

- Takes all mops — 12 through 32 ounces.
- 25% More Squeeze Pressure. Highest leverage ratio of 20 to 1.
- Double Downward-Lateral Action. Starts squeezing mop at top. Floating plate moves forward, then downward to wring out last drop of water.
- No Squirt - No Splash. Umbrella-shaped louvers force water down into bucket.
- Trouble Free Action. Simple cam. No gears or complicated mechanisms.
- Rugged One-Piece Construction. Heavy gauge steel. No rivets or welds.
- Attractive Green Hard-Bond Baked Enamel Finish.

***Measurite* BUCKETS... Graduated in Gallons**

- Exact measurement saves costly chemicals.
- 20 to 35 quart capacity.
- Oval or round with or without Rol-Easy casters.
- Galvanized or stainless steel.
- Deeply corrugated and hand-soldered throughout.
- Embossed graduations visible inside and out.

***POLY-DOLLY*... the ONLY adjustable Bucket Truck**

- Accommodates all oval and round buckets.
- Floating guide handle stays erect in pulling position, folds flat for storage.
- Wrap-around bumpers front and rear.
- Two Ball-Bearing swivel casters up front, two stationary wheels in rear.
- Heavy duty unitized steel frame.
- Attractive Green Hard-Bond Baked Enamel Finish.

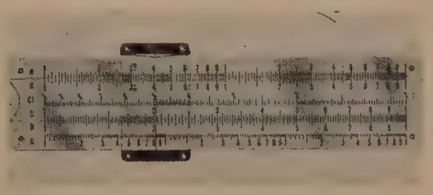
Write today for new catalog. Dept. No. NS-4

MARKET FORGE CO., Everett 49, Mass.

For additional information, use postcard facing back cover.

Authentic Detail In Transparent Slide Rule

A visual aid for use with overhead projectors, the new Beseler transparent slide

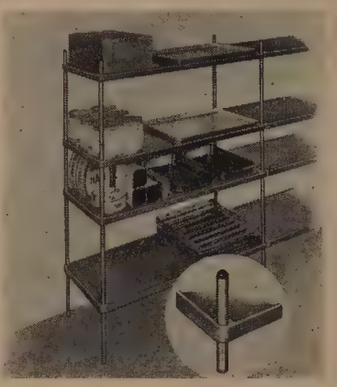


rule permits the math teacher to face his class while manipulating the unit as an image of it that is ten times its actual size appears behind him. Instruction of all slide rule technics is accelerated and simplified with the nine-inch rule of clear lucite printed with large, easy-to-read figures and with a smooth sliding transparent hair-line indicator. Authentic in detail, the unit includes a handsome, durable leatherette case and may be used as a regular slide rule when not in use in the projector. **Charles Beseler Co., 219 S. 18th St., East Orange, N.J.**

For more details circle #468 on mailing card.

General Storage Shelving Easy to Erect and Clean

Incorporating a new concept in shelving, the Marketier general storage shelves come in only three parts, shelves, posts and corner supports, erect in minutes without the use of tools, and can be adjusted to any height. The shelving is available in a variety of materials and finishes in nine stock sizes with scientifically determined selection of lengths and widths. It is easy to clean and has smooth, round corners and raised edges on all shelves that add strength and prevent items from falling off. Brackets of high strength aluminum alloy die castings are permanently



enclosed in the corners of the shelves for maximum sanitation, strength and rigidity. **Market Forge Co., Garvey St., Everett 49, Mass.**

For more details circle #469 on mailing card.

Folding Aluminum Ladder Is Emergency Fire Escape

An aluminum link chain ladder that folds compactly beneath a window sill, the new Emergency Fire Escape is designed for multi-story buildings. Opening to a sturdy safety platform that crosses the window sill, the unit has safety rails for the individual to hold before descending and can be fastened at the bottom to prevent swaying. The device is suspended on a stainless steel shaft and requires no maintenance, is easy to install and has a low initial cost. **Marryatt, Lane & Co., Inc., 248 Main St., Fort Lee, N.J.**

For more details circle #470 on mailing card.

New Model Swings Feature "Parallized" Suspension

Riders are safely level in motion with "parallized" type suspension, a feature of Game-time's new single-seater Hobby Horse and double-seater Glider Swing models, manufactured in four, six and nine unit sections. With all steel construction, except for the fiberglas horse

heads, and comfort contoured seats, the swings use a safer, eight-foot high double top rail frame with a hard, abrasion-resistant Epoxy finish that will not fade, chip or pull and is offered in nine colors. Hobby Horse units are suspended by steel chains from heavy duty ball bearing hangers, Glider units hang from the top rails on steel suspension rods, and they are each available with complete swings, in combinations, or in individual units for existing frames. **Game-time, Inc., Litchfield, Mich.**

For more details circle #471 on mailing card.

Geha COMET

The lowest-priced paste ink duplicator with built-in inking system

. . without doubt, today's biggest value in stencil duplicators

Here is a machine that is really ideal for every office. Quality built all the way through—with exclusive features you wouldn't dream of finding at such a low price. Turns out copies equal in every respect to those produced on expensive high-speed, heavy production duplicators. Handles all types of duplicating stock from post card size on up to 9½x15 (printing area: 8½ x 13½) including your office forms and direct mail. And—you can make fast color changes at no additional cost. Amazingly simple to operate—and clean to use because it uses paste ink. Geha's sturdy construction means years of trouble-free performance. Fully guaranteed.

Free Demonstration Offer

Arrange now for a free demonstration of the Geha Comet in your own office without obligation. Pin this coupon to your letterhead and mail today.

MILO HARDING CO.
177 Tempo Bldg., Monterey Park, Cal.
☐ Please arrange demonstration
☐ Send Geha Comet literature
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COMPANY_____
ADDRESS_____
CITY_____STATE_____

TEMPO®

America's highest quality & most complete line of stencil duplicators & supplies

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Established 1904
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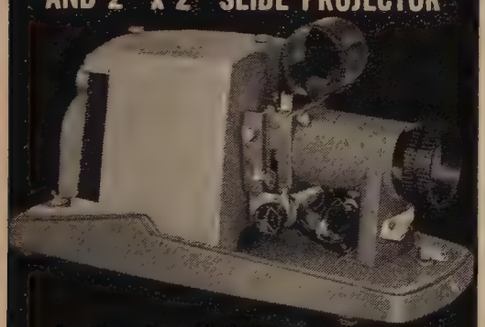
No Matter How You Look At It... Viewlex Projectors Are Easier To Teach With

Viewlex V-500-P is literally "easier to teach with" and "easier to learn with" from every point of view! Students LEARN MORE because V-500-P frees you to TEACH MORE! The unprecedented image-brilliance compels attention, even in lighted rooms . . . the simplified operation of self-threading and take-up that ends awkward, time-consuming "fumbling" ...the built-in magnifier viewer that enlarges any section for special emphasis—these, and many other built-in Viewlex "teaching assistants" in new V-500-P make learning certain; teaching faster, easier!

Viewlex V-500-P

COMBINATION 35MM FILMSTRIP AND 2" x 2" SLIDE PROJECTOR



Ask your Viewlex Audio-Visual franchised dealer for a demonstration, or write for catalog.

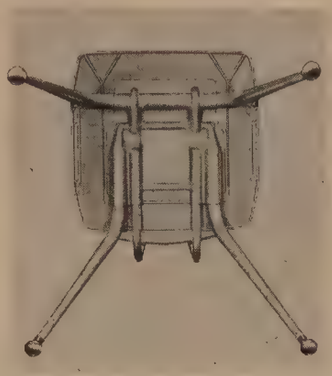
NEW! Multi-Focal Accessory Lens — infinitely adjustable 3½" to 6" focal length produces full screen image at any distance without moving projector or refocusing. $49.50

VIEWLEX INC. 35-13 Queens Boulevard
Long Island City 1, N. Y.

In Canada — Anglo Photo Ltd., Montreal

Studybilt Classroom Furniture Has Centripoise Design

Completely new school desks and chairs are introduced by Arlington Seating Company in the Studybilt line. It incorporates a new type of seat frame structure called Centripoise designed with tubular

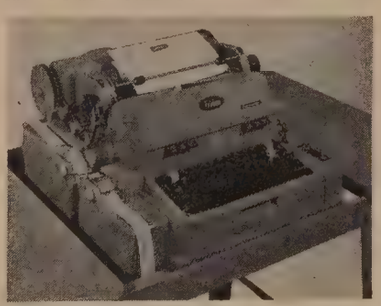


members joined to a single, formed, heavy gauge steel center plate below the seat. Greater freedom of design is permitted with pleasing visual effect, proper posture correlation and seating comfort. Twelve different design models, each in a standard range of sizes, are offered in the line which includes chairs, lift lid and open book box desks, chair desks, study desks, tablet arm chairs and upholstered chairs. Seats and backs are available in Arlex all plastic as well as in formed hardwood plywood. The one-piece back plate offers a smooth, snag-free surface to protect hands and clothes. Desk tops are offered in a choice of Plycor or Arlo high density plastic with maple grain finish. **Arlington Seating Co., Arlington Heights, Ill.**

For more details circle #472 on mailing card.

Flexowriter Personalizes Letters at 100 Words Per minute

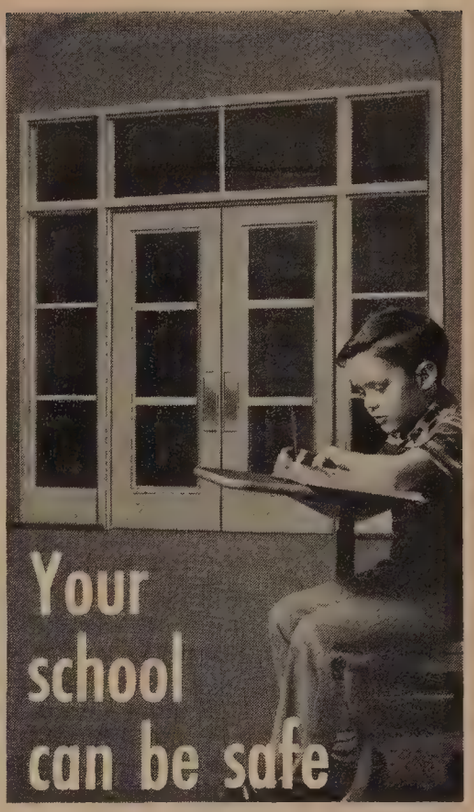
Personalized letters can be written at 100 words per minute with the distinctive appearance of proportionally spaced type on the newly standardized Flexowriter President SFD. The automatic writing machine operates with coded paper tape which is punched and corrected, then read automatically to produce error-free copies. Codes can be included when the



tape is punched to stop the Flexowriter during automatic typing for manual insertion of personal and other variable information such as inside address, salutation, amounts, names, or even additional paragraphs. If desired, an auxiliary tape reader can be cable-connected without altering the Flexowriter, permitting special information to be supplied automatically. In addition to letters, the new machine can be used in applications of almost any type. **Friden, Inc., 1 Leighton Ave., Rochester 2, N.Y.**

For more details circle #473 on mailing card.

(Continued on page 198)



from flash-fire tragedy

Your school, and children like this one, can be assured of safety from flash-fire tragedies by the installation of Overly Fire Barriers in the corridors and stairwells. Overly Fire Barriers, the *only* fully-tested and U/L rated fire barriers available today, will confine fire at its point of origin and prevent fire's heat and suffocating smoke from racing up stairwells and down corridors. They will assure 45 minutes of safety. *Compare this to the 2 to 3 minutes necessary to evacuate children from the average school!*

Overly Fire Barriers also should give you more favorable rate considerations with your insurance carrier because they substantially reduce risk. For additional information on the proper placement of Fire Barriers to protect stairwells and corridors, why not write us for the latest fire door folder, "New Fire Barrier Safety For Schools"? You may be interested in our eight-minute color film—"Fire Barriers By Overly" — which is available for group showings.

Overly

MANUFACTURING COMPANY

Greensburg, Pennsylvania

St. Louis 19, Mo., Los Angeles 39, Calif.

Newly Designed Open Front Desk Addition to Irwin 3-R Line

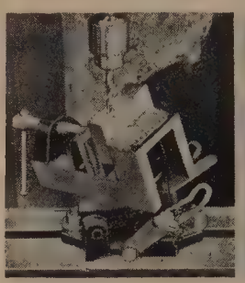
A one-piece, smooth formed bottom with rounded corners and a die formed

base with a special convenient indented trough for writing tools are features of the new design in Irwin's open front desk. The unit, with an easy-eye Textolite surface on its lid that will not mar or warp, has an overall modern appearance that blends well with other items in the 3-R Line and is available in aqua or sand. Newly developed nylon glides are an optional item on the desk. **Irwin Seating Co., 1480 Buchanan Ave., Grand Rapids 2, Mich.**

For more details circle #474 on mailing card.

Utility Vises Feature Removable Swivel Jaws

Precision built for accurate all-around use in school shops, tool rooms and machine and repair shops, the new line of Stanley-Yankee utility vises is designed for use on drill presses, grinders and other machines. Including new angle, swivel and swivel-tilt vises, the line features exclusive removable swivel jaws for holding tapered and irregular shapes firmly. The vises, accurately machined on all sides, are built with hardened and ground



removable steel jaw faces and strong-threaded screws, and can be readily converted into jigs. **Stanley Tools Div., The Stanley Works, 195 Lake St., New Britain, Conn.**

For more details circle #475 on mailing card.

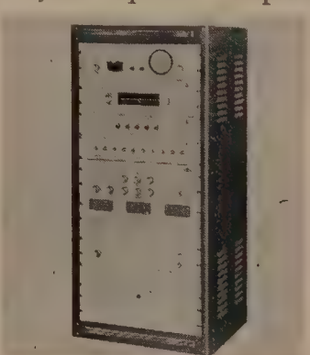
Color Slides and Overlays For Teaching and Testing

A complete science program on eight by 10-inch color slides with multi-overlays simplifies teaching and testing of complex and detailed subject matter. For teaching, the instructor projects the base transparency and flips in successive overlays, accomplishing a step-by-step build-up of charts, diagrams and pictures as the lesson progresses. For testing, one or more of the overlays are withheld and the student is asked to fill in the missing information. The transparencies permit individualized lessons as the teacher can draw or write on the slides as he demonstrates. Made for overhead projectors, the Series 100 Slide Library consists of lessons for six categories, each divided into sub-categories. **Tweedy Transparencies, 321 Central Ave., Newark, N.J.**

For more details circle #476 on mailing card.

Custom Sound Components Cover All Requirements

All requirements for sound distribution, from music distribution to high power paging equipment, are included in the complete new line of compatible custom sound components introduced by Webster Electric. Called the Webster custom sound line of rack-mounted equipment, all parts are engineered to provide as complete a unit as may be required. Components in-



clude an AC power panel; relay panel; inlay panel; AM-FM tuner; monitor panel; output panel; a four-speed phono changer and/or a tape player; a pre-amp panel; amplifiers; speakers; microphones, and the basic rack. Any combination can be installed with compatibility. **Webster Electric Co., Racine, Wis.**

For more details circle #477 on mailing card.

THERE'S A DIFFERENCE IN COOLERS

serve from the finest to insure the success of your school's milk program

From Pennsylvania . . . New York . . . Wisconsin . . . Illinois—in fact from all over the nation, come reports that school children are drinking more and more milk under the School Milk Program.

These reports indicate that more and more in-school cooling and storage capacity is going to be needed—storage that can be depended upon to keep milk as fresh, wholesome and palatable as it is when delivered.

For many, many years, S & S Quikold coolers have served schools across the nation. QuiKold coolers have earned for themselves a reputation for having the quality which school administrators are looking for; for only the finest of materials and component parts are used in the manufacture of these dependable coolers to make them second to none for long life; trouble-free service and economical operation.

If your school is expanding its milk program and contemplating the purchase of new cooling equipment, it will pay you to get the facts on QuiKold coolers from your local milk supplier, or write to us direct. There's an S & S QuiKold cooler to fit your program.

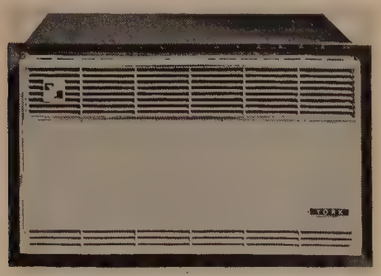
S&S Products, inc.

P. O. BOX 1047 LIMA, OHIO

Better Beverage Merchandisers Since 1926

Room Air Conditioners Are "Powerful-Quiet"

A new compressor, dual pistons with automotive piston rings to insure top cooling capacity, and a system of jet-



type tubes feeding refrigerant to the compression chambers give the "powerful-quiet" York line of room air conditioners added cooling power; while dual suspension of the internal and external mechanism of the compressor absorbs vibration and an acoustically designed front silences air sound for ultra-quiet operation. Other features of the 1960 line include a hygienic-clean filter, multi-direction air grilles, heavy gauge steel casings, variable cooling speeds and an automatic thermostat. The conditioners are available in three sizes, the compact, lightweight Adventurer, the medium-sized Discoverer, illustrated, and the Conqueror, a multi-room unit. All models have been restyled and are manufactured in a dark or a pastel grey trimmed with silver. **York Div., Borg-Warner Corp., York, Pa.**

For more details circle #478 on mailing card.

Acousti-Vent Units For Large Area Rooms

For use in auditoriums, gymnasiums and other large area rooms, Schemenauer's Acousti-Vent line of heating and ventilating units features an acoustical chamber permitting quiet operation. The units, available in 16 sizes, are for use with hot water or steam heating systems and may be installed in a horizontal, vertical or inverted position. **Schemenauer Mfg. Co., Holland, Ohio.**

For more details circle #479 on mailing card.

Tape Storage Cabinets Feature Color Coded Subject Index

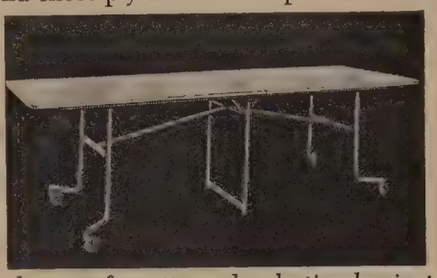
Facilities for the filing of the master tapes used in language laboratories are provided in a new line of Neumade stor-

age equipment. Featuring color coded subject indexing, position retaining clips and key locks for maximum security, the cabinets employ simplified indexing and cataloging to ensure prompt location of subject matter and reduce the possibility of mis-filing. **Neumade Products Corp., 250 W. 57th St., New York 19.**

For more details circle #480 on mailing card.

Easily Operated Benchless Table In Howmatic "TN"

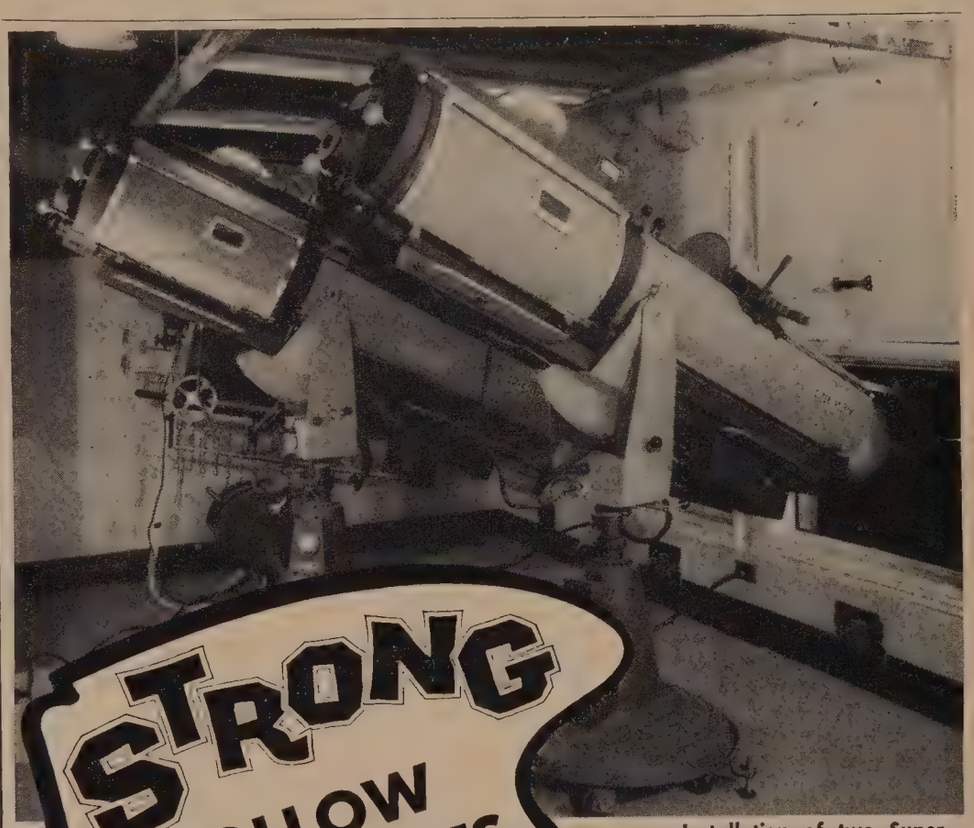
The Howmatic "TN," an easily operated, economy-priced benchless mobile unit, is held in check by springs when partly opened until either opening or folding actions are continued by the operator, and locks automatically when completely opened, remaining in that position until unlocked for folding. With free-wheeling, castered end legs, the new cafeteria-type table's features include a one-inch safety gap where the top halves meet and two-inch radius safety corners, a low center of gravity that prevents tipping, and single-fold structure that eliminates corners where food might accumulate. Available in six, eight, 10 or 12-foot units, the "TN" seats from eight to 18 pupils comfortably, and has all-steel chassis and legs finished with cadmium and a solid sheet plywood core top covered with



a layer of patterned plastic laminate. **Howe Folding Furniture, Inc., 1 Park Ave., New York 1.**

For more details circle #481 on mailing card.

(Continued on page 200)



STRONG FOLLOW SPOTLIGHTS

Installation of two Super Troupers at the Berkeley High School, Berkeley, California.

Installed in public and parochial grade schools, high schools, colleges and universities in every state for plays and concerts in the auditorium, dances and entertainments in the gym, and half-time ceremonies in the stadium.

INCANDESCENTS THAT ARE 9 TIMES BRIGHTER
ARCS THAT ARE 15 TIMES BRIGHTER
Require no extra equipment—plug into 110 V A.C. outlet
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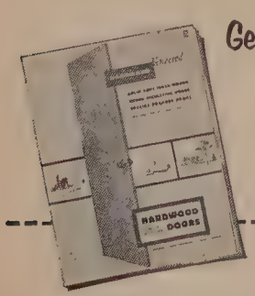
Isolate disturbing noise and sound in music and band rooms, gymnasiums, workshops and hallways with this nationally famous sound insulating door. Pre-measured for sound reduction, you know in advance the final noise factor. Sound Insulating Doors come in 35, 40 and 43 decibel degrees of transmission loss — controlling a full range of sound intensity. Write for details or consult your architect or acoustical engineer.



Get this FREE brochure

It tells in understandable non-technical language how SOUND INSULATING DOORS function — how sound intensity is measured and controlled.

WRITE BOX NS

HARDWOOD PRODUCTS CORPORATION

NEENAH • WISCONSIN

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Tapered Steel Understructure In ScholarCraft Lecture Desk

The ScholarCraft Model No. 749 lecture desk has a heavy gauge welded steel tubular frame of free-standing construction complete with a book storage tray of solid steel rod welded into an integral unit and closed on three sides. The

tapered legs are of modern design, equipped with rubber cushioned, swivel type, case hardened steel floor glides nickel and chrome plated to prevent marring. With a 20 by 24-inch laminated plastic hardwood writing surface mounted to the frame by wood screws, the new unit is available with a bronze or green metallic or chrome plated finish. **Southeastern Metals Co., 3925 N. 29th St., No. Birmingham 7, Ala.**

For more details circle #482 on mailing card.

Challenger Mortise Deadlocks Offer Greater Security

Increased security for any deadlocking or deadbolting requirement is provided with the two new Challenger mortise deadlock series. Available in five different functions in either brass or bronze, all units have either a five or six pin cylinder and can be interkeyed with other key locks. The extra heavy series features a one-inch throw bolt. **Challenger Lock Co., 2349 W. La Palma, Anaheim, Calif.**

For more details circle #483 on mailing card.

Automated Flaked Ice Machine in Mobile Type Unit

The Ross-Temp Roll-O-Matic is a combination roll-away bin with a choice of three capacities of continuous flow flaked ice machines. The Roll-O-Matic insulated storage bin rolls under the ice machine which shuts off automatically when the cart is removed. The filled bins are then

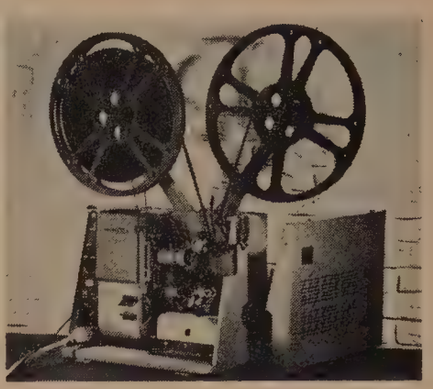
rolled to kitchens, cafeterias and other food service areas where the ice is used. Bin capacity is 250 pounds of flaked ice, and ice machines are available in capacities of 150, 250 and 500 pounds in 24 hours. **Ross-Temp, Inc., 1805 S. 55th Ave., Chicago 50.**

For more details circle #484 on mailing card.

(Continued on page 202)

QUIETEST

running 16mm sound projector ever built

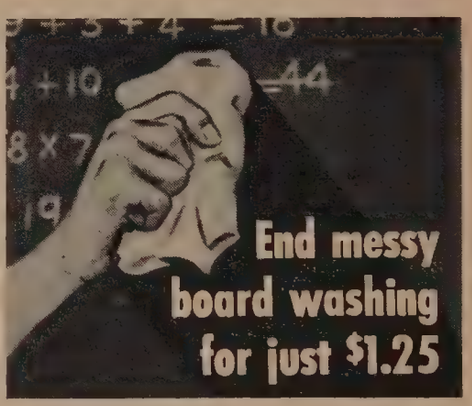


KALART VICTOR

FREE — Treasure Chest of Audio-Visual Ideas. Illustrated booklet tells how to use films most effectively. For your copy, circle #619 on mailing card, page 215.

Victor Animatograph Corp., Div. of Kalart

PLAINVILLE, CONNECTICUT



NEW K_2 Kleer-Kleen chalkboard cleaner ends tedious, messy, bucket-of-water washing . . . eliminates streaky, faded looking boards. A wipe of a Kleer-Kleen-dampened cloth cuts through chalk haze and "ghost" marks . . . leaves the surface conditioned for easier, more thorough erasing. Compounded by the nation's leading manufacturer of chalkboards, it promotes legibility by maintaining the clear contrast between board and chalk. Available direct at $1.25 a pint, $2.00 a quart. Pint normally lasts a full semester for a typical classroom. *Not recommended for stone slate chalkboards, because of their porosity.*

Send . . . (Quantity) ☐ Quarts ☐ Pints of K_2 Kleer-Kleen along with invoice.

NEW YORK BOOK SLATE COMPANY, INC. SILICATE

600 Old Country Road
Garden City, New York

FOR TYPING CLASSES OR SINGLE OFFICE

$6.95

WRITE FOR QUANTITY DISCOUNT

18"x24"
ALL STEEL
K. D.
2 PER
CARTON
27" HIGH
CAT.
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1. Guaranteed
2. All Steel
3. Shipped K.D.
4. Will hold 500 lbs. or more
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6. Sample on Request
7. Nationally Advertised
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AAA SALES
9142 OLIVE ST. ROAD
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EDWARD DON & COMPANY

7 Advantages ..in dealing with DON for your lunchroom needs

1. Huge Variety—50,000 Items
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3. Each item a genuine value
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Get This FREE and save Money for Your School

To become acquainted and get benefits from dealing with DON, send for this bulletin of timely and appropriate items. It will pay you to read "DON NEWS" regularly. Write Dept. 16.

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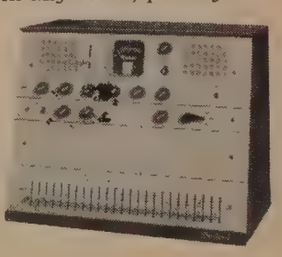
Rauland SOUND for the SCHOOL

RAULAND Central Sound Systems are the result of many years of experience in school requirements. To assist the busy administrator of today's complex modern school, RAULAND offers complete facilities for program distribution, 2-way communication and simplified administrative control.

Model S752
Dual Channel System; capacity up to 121 rooms

all desirable functions available

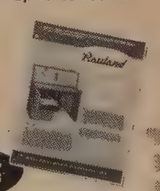
- ★ **Microphone**—programs and announcements from multiple microphone locations
- ★ **Intercom**—voice conversation with any room; privacy feature available
- ★ **FM-AM Radio**—distributes any radio program to any or all rooms
- ★ **Phonograph**—distributes program (transcription player or automatic phonograph) to any or all rooms
- ★ Optional Features—Disaster Emergency Switch; light annunciation; program clock signals, etc.



Model S600
Dual Channel; for up to 46 rooms

FREE SCHOOL SURVEY. An experienced RAULAND Engineering Distributor is available in every major city to survey your buildings and make practical recommendations. No obligation, of course. Send coupon today.

RAULAND-BORG CORPORATION



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☐ Send full details on all RAULAND School Sound Systems
☐ Have the RAULAND Distributor contact us

Name_____ Title_____

School_____

Address_____

City_____ Zone___ State_____

Improved Styling and Operation in Remington Standard Typewriter

The new Remington Standard Typewriter features improvements in both appearance and operation. The overall appearance is changed in harmony with modern design, and the improved "responsive touch" makes it easy and smooth to operate. It is available in a wide variety of colors, and an Interchangeable Type Bar can be included to permit the use of special technical type faces or trade mark symbols, and optional additional bars permit the handling of more than 100 type styles. The machine features margin stops for positioning without moving the carriage; Fold-A-Matic construction for rapid breakdown for cleaning and maintenance; down-swept carriage return bar; enlarged platen knobs; transparent card holders with a control for adjusting to the thickness of manifold packs; a removable top plate, and a key release for clearing jammed keys, among others. **Remington Rand, Div. Sperry Rand Corp., 315 Park Ave., New York 10.**

For more details circle #485 on mailing card.

Indexing Kit For Microfilm Records

A new indexing kit, complete with instruction booklet, provides an easy step-

by-step method for finger-tip accessibility of records on microfilm. For use with nearly any type of microfilmer, the kit includes flash cards, targets and other forms for proper organization of the material on film. **Recordak Corp., 415 Madison Ave., New York 17.**

For more details circle #486 on mailing card.

"Bally-Hi" Extension Ladder Straddles Seats, Desks and Furniture

The "Bally-Hi," a useful and versatile new ladder for repair and maintenance work that can straddle seats in auditoriums and desks or furniture in classrooms and offices, consists of a 28-foot two-stage ladder mounted on a sturdy, wheeled frame equipped with collapsible outriggers. The aluminum extension unit has guard rails along the entire length and a pulpit-type rail at the top, four-inch swivel type casters and other features, and collapses to a height of 77 inches so that it will go through ordinary size doorways. **Ballymore Co., West Chester, Pa.**

For more details circle #487 on mailing card.

All Fifty States on Rand McNally Map

A new map showing all fifty of the United States is now available from Rand

McNally. Everything about the map is new — the color scheme, the easily read type and our two new states. Information in addition to boundaries, state names and capitals, covers warm and cool ocean currents, voyages of discovery to Alaska and Hawaii, Great Circle Direction and Distance, geographic and global centers, time compared to noon in London, and date and rank of admission of each state. **Rand McNally & Co., P.O. Box 7600, Chicago 80.**

For more details circle #488 on mailing card.

ASSURED: quality . . . value . . . comfort

This buyer is confidently enjoying the comfort of a Durham chair — a chair he knows takes rough usage in public or semi-public buildings without losing the important features of comfort and good looks. Electronic brazing for unmatched strength, eyelet spacers that are weight bearing and silent turning, safety links that prevent tipping are among the construction details which sell discerning buyers on the quality of Durham steel folding chairs. Get the story of Durham quality, value, comfort! Supply *your* needs from our selection of styles and designs — most complete on the market.

No. 868

No. 875

No. 805R

Tubular or channel steel frames in many styles: All steel; padded, upholstered seats and backs; wood seats. Tablet armchair with wrap rack. Chair accessories include book racks and kneelers. Chair sizes for children under 10. Stack chairs, all steel or vinyl-clad, with dollies for easy moving and storage.

Write for catalog. See why your best buy is Durham.

Durham
THE FINEST METAL FURNITURE

TESTED AND APPROVED BY LEADING INSTITUTIONS FOR OVER 60 YEARS

DURHAM MANUFACTURING CORPORATION • MUNCIE, INDIANA

Visionaire Magazine Rack Features Large Capacity

Part of the Stacor Visionaire line of library furniture and equipment, the new Magazine Rack combines excellent display with large capacity, holding up to 40 magazines. Available in a smaller size designed to hold 23 periodicals, the rack is an intermembering unit that will fit

existing equipment already in use. **Stacor Equipment Co., 295 Emmet St., Newark 5, N.J.**

For more details circle #489 on mailing card.

Ten-Inch Wall Tile Now Available in Formica

Walls in washrooms, corridors and other areas where an impervious surface and attractive appearance are desirable can now be covered with the new Formica Wall Tile. The material comes in ten-inch squares and is flexible enough for butting together for uniform seams. Packaged 50 tiles to a box, six boxes to a carton, Formica Wall Tile is applied with Formica Fast Dry Contact Bond cement to plaster at least 30 days old, or with Formica Wall Tile Adhesive to dry wall or plywood. The new product has the durability of Formica and is available in eight colors and patterns and three wood grains. **Formica Corporation, Cincinnati, Ohio.**

For more details circle #490 on mailing card.

Turf-King 76 for Large Capacity Mowing

The Turf-King 76 riding power lawn mower is a three-reel, nine h.p., four-cycle unit developed for rugged use on parks,

school grounds, athletic fields and similar areas. With hillside and slope mowing ability and reels that can be arranged to cut separately, in a combination of two, or all three at the same time, the new unit has large capacity and features variable cutting speeds, a self sharpening device for all three reels simultaneously without disassembly, and micrometer thread screws for fine adjustments. **Jacobsen Mfg. Co., 747 Washington Ave., Racine, Wis.**

For more details circle #491 on mailing card.

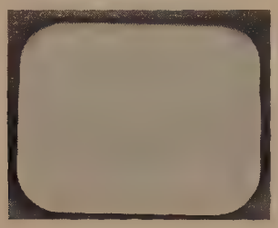
(Continued on page 204)

for FREE demonstration or literature address:
WEST CHEMICAL PRODUCTS INC., 42-35 West St., Long Island City 1, N. Y.
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

for FREE demonstration or literature address:
WEST CHEMICAL PRODUCTS INC., 42-35 West St., Long Island City 1, N. Y.
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

Compartment Paper Plate In Rectangular Shape

An eight by ten-inch rectangular compartment plate, available in a complete



matched service for use by institutional feeders, is manufactured in a soft green and brown "Floral" design as well as in plain white. The new plate's shape and small brim permit greater food area and depth, and the compartments lend rigidity so it can be carried in one hand when full, and reduce food intermingling. Five new round plates are also available in the matched "Floral" design. **Dixie Cup Co., 24th & Dixie Ave., Easton, Pa.**

For more details circle #492 on mailing card.

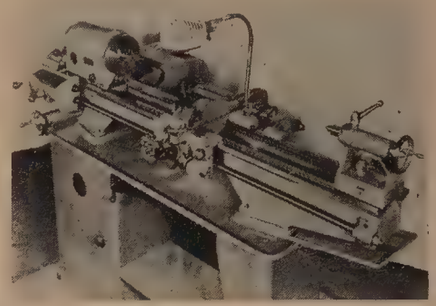
B-Y Unit's Folding Mechanism Has Steel Torsion Bar

Buoyancy and ease of operation are increased with the addition of a steel torsion bar in the folding mechanism of the 1960 Sico B-Y table and bench combination. Only slight manual effort is required to initiate the fold and the top and attached benches travel smoothly to the open and upright storage positions. Another improvement is the simplified bench removal permitted with new finger operated fasteners which hold the benches securely in place and allow for their removal without the use of tools so that the tables may be used alone. **Sico Mfg. Co., Inc., 5215 Eden Ave. S., Minneapolis 24, Minn.**

For more details circle #493 on mailing card.

"Long Bed" 10-Inch Lathe Has Two Safety Features

Compact, modern looking and easy to operate, the new "long bed" model Delta 10-inch metal cutting lathe has two safety accessories that make it particularly appli-

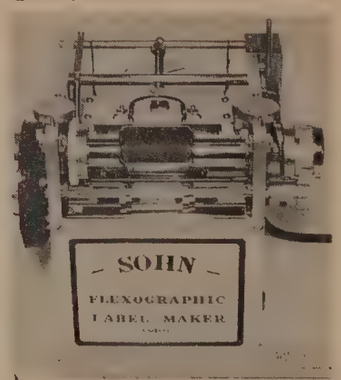


cable for school shops. A magnetic starter electrical disconnect switch kit automatically shuts off the motor when the headstock cover is swung open, and a mechanical back gear lock-out kit forces the operator to raise the headstock cover before the back gears can be engaged. Other features of the unit, which has a capacity of 36 inches between centers, include a variable-speed drive, ¾ inch collet capacity, quick change gear box and apron clutch. The model is used with a full ¾ h.p. motor. **Rockwell Mfg. Co., Delta Power Tool Div., 471 N. Lexington Ave., Pittsburgh 8, Pa.**

For more details circle #494 on mailing card.

Sohn Label Maker Is Tiny Flexographic Press

Activity tickets, book and laboratory identification labels, passes and many other items can be printed with professional quality on the Sohn Label Maker, a



precision made, ruggedly constructed portable flexographic printing press. Weighing only 40 pounds, the nine by nine by nine-inch unit is simply operated and can print 6000 labels per hour on pressure sensitive, gum, heat seal or plain paper. Also useful for teaching flexographic printing press operation, the small machine makes brilliantly colored labels and the color and printing plates are changed in seconds. **Sohn Mfg., Inc., P. O. Box 87, Plymouth, Wis.**

For more details circle #495 on mailing card.

(Continued on page 206)

HOW MANY TOOTS IN A TUBA?

And, how far is "up"?

One thing we do know—if the tuba is made by Conn, your school can expect many years of fine toots with a minimum of maintenance and expense.

Conn has been the acknowledged leader in instrumental school music since its beginning in the early 1920's . . . backed by more than 85 years of experience.

All the information we have garnered over the years is yours for the asking.

May we be of assistance?

EDUCATIONAL AIDS CATALOG—Wall charts, film strips, music folios, inventory and depreciation records, student performance files, care of instruments instructions, fingering charts, technical manuals on instruments and acoustics, aptitude tests, pre-band instruments and teaching aids, rhythm band instruments.

INSTRUMENTAL CATALOG—Complete selection of brass and woodwind instruments, cases and electronic teaching devices.

HOW TO ORGANIZE A BAND—Complete information on how to get started, costs involved and free personal help by an experienced Conn representative.

CONN BAND INSTRUMENTS

SEND FOR FREE INFORMATION!

CONN CORPORATION, Dept. K-3009 Elkhart, Indiana

Please send without charge materials checked:

☐ Educational Aids Catalog ☐ Instrumental Catalog

☐ How to Organize a Band

name

school

address

city, state

AMERICAN

The Combination Lock with the "BLUE DIAL"

3 Number Locking Mechanism

Self Locking

2 Styles With or Without Key Control

FREE SAMPLE
REQUEST ON YOUR LETTERHEAD

Stainless Steel Case

GUARANTEED FOR TWO YEARS

Write for CATALOG 100

JUNKUNC BROTHERS
AMERICAN LOCK COMPANY
4941 S. Racine, Chicago 9, Ill.

Seat your School today for generations to come with INTERNATIONALS

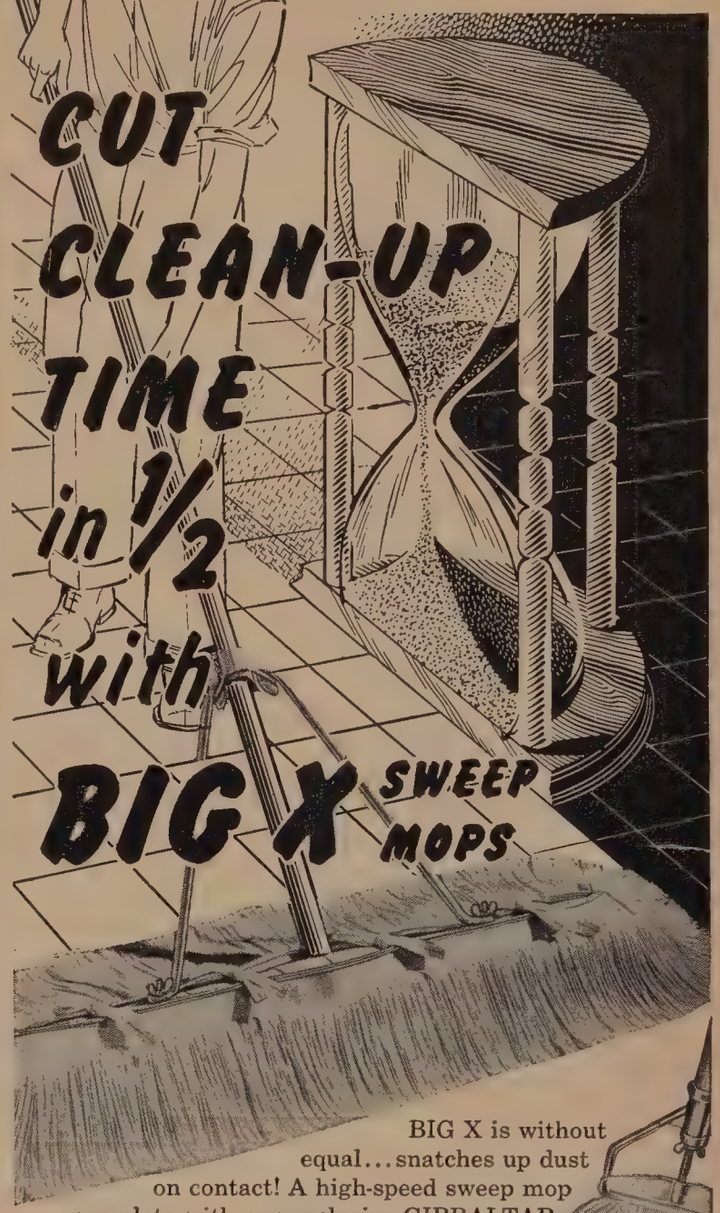
The Chair With A Backbone

Send today for helpful seating literature.

International Chairs

International Seat Division, Union City Body Company, Inc.,
Union City, Indiana

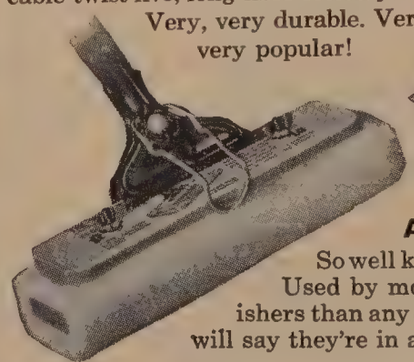
CUT CLEAN-UP TIME in 1/2 with BIG X SWEEP MOPS



BIG X is without equal... snatches up dust on contact! A high-speed sweep mop complete with our exclusive GIBRALTAR brace... Amazing durability... Available in widths up to 5 feet!

VICTORY Wet Mops

Cost least to use because of their high efficiency and double-length life... 16-ply cable-twist live, long-fibre cotton yarn... Very, very durable. Very, very popular!



HOLZ-EM Applicators

So well known they need no praise. Used by more professional floor finishers than any other applicator. You, too, will say they're in a class by themselves.

Order AMERICAN STANDARD products from your regular supplier. He has them or can get them for you. If not, write us direct.

"TOPS IN MOPS"
AMERICAN STANDARD MFG. COMPANY
Incorporated 1908

CHARLES E. KREBS and WALTER O. KREBS
2505 SOUTH GREEN STREET • CHICAGO 8, ILLINOIS

Don't Mop School Floors with Dollar Bills!

Save money—save time with flexible, efficient GEERPRES Mopping Outfits

If you're not using a GEERPRES mopping outfit, floor cleaning is probably costing you more than you think. Only GEERPRES has the design features and rugged construction to save costly labor time, give maximum service life.

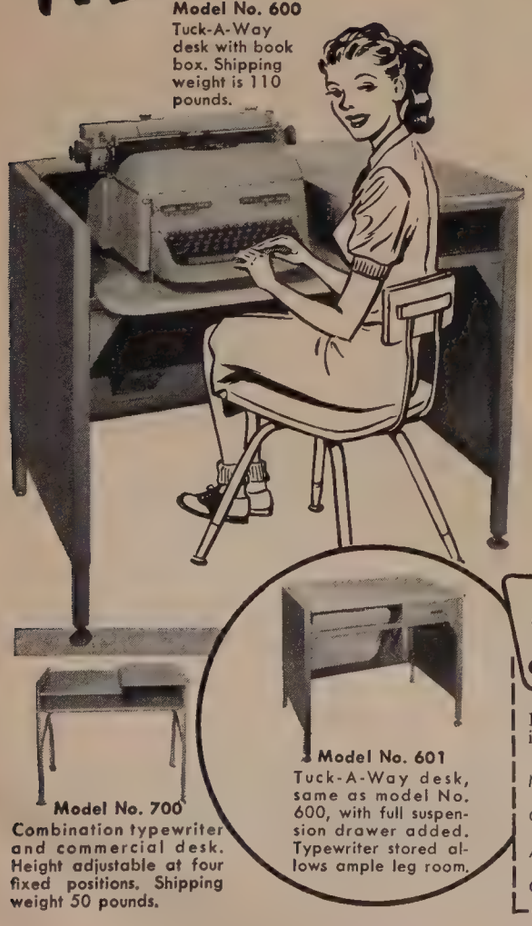
Wringers give you powerful, uniform squeezing action—wring mops dry, quickly, easily, smoothly, in single operation. Patented design keeps splash and spray off cleaned floors. Electroplated wringers, galvanized buckets end rust—last for years. Mops last longer because wringers cannot twist, tear, tangle. Ask your jobber or write for catalog.

Geerpres WRINGER, INC.

FLOOR-KING MOPPING OUTFIT FOR MOPS TO 36-OZ.

P.O. BOX 658, MUSKEGON, MICH.

NEW TUCK-A-WAY COMMERCIAL TRAINING DESKS



Model No. 600 Tuck-A-Way desk with book box. Shipping weight is 110 pounds.

Model No. 601 Tuck-A-Way desk, same as model No. 600, with full suspension drawer added. Typewriter stored allows ample leg room.

Model No. 700 Combination typewriter and commercial desk. Height adjustable at four fixed positions. Shipping weight 50 pounds.

Designed to improve facilities for steno trainee or for office worker, the Tuck-A-Way "dual purpose" is first an efficient typewriter desk that provides for every necessity in use, and second, a safe typewriter storage. When not in use as a typewriter desk, the Tuck-A-Way becomes a full 38" long by 26" wide, flat top desk for other class room uses.

The typewriter lowers into a specially protected cradle where it is out of the way and out of sight. The Tuck-A-Way desk top is made of 5/8" indestructible Fiberesin solid plastic in tan birch finish, all steel understructure is finished in light brown baked enamel.

MAIL COUPON TODAY!

Smith System MANUFACTURING COMPANY

Dept. A 212 Ontario Street S.E.
Minneapolis 14, Minn.

Please send me catalog with full information on items shown above.

Name_____ Title_____

Company_____

Address_____

City_____ State_____

Single-Side-Band Transmission Units Have High Speech Intelligibility

Models 440 and 440SL are pressure operated microphones, use the balanced-armature controlled magnetic principle, and have a high output level, smooth response and a semi-directional pickup pattern. Designed for single-side-band

transmission, both units have a high speech intelligibility for the narrow audio frequency range required, with an average rising characteristic that helps to mask background noise. The 440SL is an integral assembly of microphone, grip-to-talk slide-to-lock switch, and desk stand, and the 440 has a standard 5/8 inch 27 thread and can be mounted on any desk or floor stand. **Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Ill.**

For more details circle #496 on mailing card.

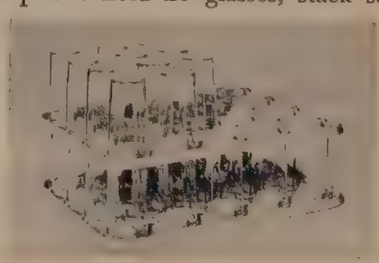
Fluorescent Fixture for Outdoor and Indoor Use

Sturdily constructed with a shatterproof plastic lens, the type HLG fluorescent fixture is especially designed for outdoor installation. The fixture has many indoor applications as well, and when mounted in continuous rows on a ceiling such as that of a swimming pool, its wide light distribution improves the lighting quality. Of corrosion-resistant alloys and with gasketed joints, the housing is an extruded aluminum channel with cast aluminum end caps, and the reflector fastens securely but is quickly removed without the use of tools. **Crouse-Hinds Co., Syracuse 1, N.Y.**

For more details circle #497 on mailing card.

Stak-A-Glas Trays of High Impact Plastic

The Silite Stak-A-Glas trays of high impact plastic hold 20 glasses, stack safely

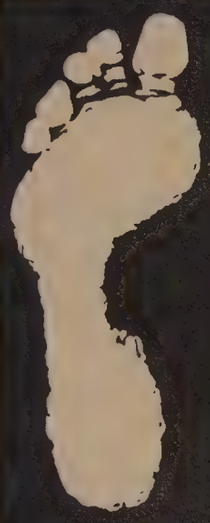


one on top of another for storing in small space, and prevent glasses from chipping or breaking. Featuring ridge and groove construction, which allows air to circulate between glasses so they dry while stored, the new trays may be washed in commercial dishwashers and are resistant to mild acids, alkalis and staining. **Silite, Inc., 2600 N. Pulaski Rd., Chicago 39.**

For more details circle #498 on mailing card.

(Continued on page 208)

Accepted Procedure...



against
Athlete's foot
with modern
DOLGE Fungicides

DUSTING Alta-Co Foot Powder on the feet and inside shoes
FOOT BATH Alta-Co Powder dissolved in water for group prophylaxis
FOOT WASH H.D. Fungicide diluted in 300 parts water—mop on floor

Write for Booklet on Athlete's Foot Control

Dependable DOLGE
WESTPORT, CONNECTICUT

Bally walk-ins

Aluminum or steel sectional construction

Sanitary! Strong! Efficient! You can assemble any size cooler, freezer or combination in any shape from standard sections. Add sections to increase size as your requirements grow. Easy to disassemble for relocation.

Bally Case and Cooler, Inc., Bally, Pa.

Get details — write NS-9 for FREE book.

Modern as tomorrow!
...Priced for today's budget!

KRUEGER All-New FIBERGLASS CHAIRS

No. 3201 ARM CHAIR
Black or Chrome steel legs

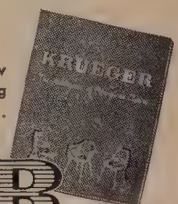
No. 3101 SIDE CHAIR
Black or Chrome steel legs

Curved and shaped to body contours, Krueger's Fiberglass chairs help raise the standards of seating comfort — add colorful warmth and beauty to any room setting. You can tell a Krueger chair by its rich, smooth finish — free from seat "bumps", because the leg attachments are molded-in as an integral part of the one-piece fiberglass body. These chairs offer seating flexibility, too, because you can stack or gang them (Model 3001) . . . and mix or match their softly hued decorator colors of Sand Beige, Shell Coral, Evening Gray, Turquoise and Parchment.

UNSURPASSED FOR DURABILITY . . .

Krueger Fiberglass is virtually indestructible, is color permanent and cleans like new. The strong tubular steel legs are wobble-free and built to last a lifetime! In short, these chairs are terrific . . . and priced far below what you'd expect to pay for such permanized quality.

Write for colorful new descriptive brochure showing actual Fiberglass colors.



KRUEGER
METAL PRODUCTS • GREEN BAY • WISCONSIN

FIGHT
ATHLETE'S FOOT
the MODERN way

What does it take to protect everyone who uses your shower rooms against Athlete's Foot? It takes the unique advantages only SANI-MIST provides—

- **Maximum protection** against Athlete's Foot—with individual, undiluted applications of SANI-MIST solution—in just 30 seconds.
- **Inviting to use.** Cool, refreshing SANI-MIST is clean and personal.
- **Minimum maintenance.** No mixing of solutions. A few minutes under a hot shower keeps the SANI-MISTER sparkling clean and inviting.
- **No time out for repairs.** The reliable, durable SANI-MISTER is made of stainless steel and aluminum, to take plenty of traffic.

The low-cost SANI-MIST method is used in thousands of industrial plants, schools and country clubs. Use the coupon below to find out what it can do for **you:**

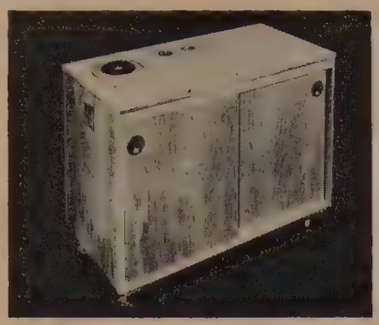
SANI-MIST INC.

Dept. NS, 3018 Market Street
Philadelphia 4, Pa.

Please send us
_____ FREE sample of SANI-MIST Solution
_____ Complete details on this unique method
Company_____
Address_____
City_____ State_____
Your Name_____

Movable Food Demonstration Center For Homemaking Departments

Designed as a supplementary demonstration center for Homemaking Departments, the "Porta-Kitchen" is also of use as a coffee bar, in teachers' lounges, general purpose rooms, maintenance departments, recreation rooms and for PTA activities. Mounted on heavy duty casters, the movable unit has a three-heat 110-volt burner set into a generous laminated work surface, overhead roller suspension doors in color, adjustable shelf and tote tray storage, a removable maple cutting board and a metal covered asbestos heat resistant pad. Optional attachments available include a mixing unit, blender, juicer, sharpener, grinder, shredder and extra mixing bowl. **Educators Mfg. Co., P.O. Box 1261, Tacoma 1, Wash.**



For more details circle #499 on mailing card.

Futron 25 Disinfectant Leaves No Odors or Stains

A highly concentrated disinfectant, detergent, deodorizer and descaler, Futron 25 is practical for use in swimming pools, locker rooms and throughout the school. The disinfectant kills both gram positive and gram negative bacteria and is non-toxic, non-flammable, non-corrosive and will not harm hands. The odorless concentrate leaves no stains and can be added to the final rinse in washing of linens or clothing for complete sterilization. **Hysan Products Co., 923 W. 38th Pl., Chicago 9.**

For more details circle #500 on mailing card.

Wall-Hung Waste Receptacle Saves Floor Space

Practical for washrooms, corridors, vending machine locations and any areas where floor space is limited, Lawson's Wall-Hung Waste Receptacle No. 6006 is attached securely to a wall with only three screws. It is released for emptying by a simple lift with the hands and is snapped back into position quickly and easily. Of heavy-gauge, bonderized steel, the 36 by 18 by nine-inch receptacle is finished in white baked enamel with stainless steel trim and has a capacity of 12½ gallons. **F. H. Lawson Co., 801 Evans St., Cincinnati 4, Ohio.**

For more details circle #501 on mailing card.

WHEREVER CHILDREN PLAY *Safely!*

Recreation equipment with engineered safety to meet the most rigid requirements.

- Playground Equipment
- Indoor Basketball Backstops
- Swimming Pool Equipment

Literature for each line available on request—please specify.

DEALER INQUIRIES INVITED

RECREATION EQUIPMENT CORP
Dept. NS-260 — 724 W. 8th St.
Anderson, Indiana

More time for teaching

NEW L&L T-Rule

Draw goemetric figures — business forms — shop drawings . . . Fast! Rule chalkboards with vertical lines — horizontal lines — curved or diagonal lines . . . Simply — Easily — Rapidly. New L & L T-Rule attaches to any chalkboard in 7 minutes. Ideal for bookkeeping, geometry, shop, music, and other classes.

Ask your School Supply Dealer or write:

MASTER ADDRESSER COMPANY
6500-NS W. Lake St., Minneapolis 26, Minn.

Literature and Services

• On the premise that a new order of educational productivity is a vital need and that the school structure should contribute to it, Carrier Corporation sponsored an exhaustive research program into American school design which was conducted by Golemon & Rolfe, architects and engineers of Houston, Texas. No restrictions were placed on the research team and the school resulting from their study is described in detail in a 20-page report available from Carrier Corp., Syracuse 1, N.Y. Entitled **"Environment For Learning,"** the booklet discusses the problem, the comparison school, the solution, including plans and renderings, engineering considerations, cost comparison and sums up the results. A bibliography of reference sources is included.

For more details circle #502 on mailing card.

• "How to Lay a Lifetime Floor of Northern Hard Maple," "The School Gymnasium as a Social Center," and "Report of Survey — College and High School Basketball Coaches Comment on the Ideal Gymnasium Floor" are titles of some of the **technical literature** available from Maple Flooring Mfrs. Assn., 35 E. Wacker Dr., Chicago 1, the authority for northern hard maple, beech and birch flooring grading practice.

For more details circle #503 on mailing card.

• An attractive catalog of the comprehensive line of **"Planned Educational Equipment for Homemaking"** manufactured by Royal Mfg. Co., Inc., Richmond, Va., is now available. The 40-page booklet is illustrated with line drawings and photographs showing the various types of cabinets, storage cases, mirrors, kitchens, sewing tables and other products in the complete line. Specifications and elevation drawings are also included.

For more details circle #504 on mailing card.

• All sizes of wall shelving, charging desks, tables, chairs and a miscellaneous line of library equipment are described in the new **"Library Equipment and Furniture" Catalog** recently released by Heller Co., Library Div., 58 Wabash Ave., Montpelier, Ohio. The 16-page brochure provides specification charts, photographs and diagrams to facilitate library planning.

For more details circle #505 on mailing card.

• **"Designs for School Buildings"** is the title of **Folder B-13659,** an illustrated brochure available from Armco Drainage & Metal Products, Inc., 13659 Curtis St., Middletown, Ohio. It shows the different ways that three architects solved one basic school building problem with rigid frame steel buildings.

For more details circle #506 on mailing card.

• Data on **Perma Cushion Free Floating Floor System and Ironbound Continuous Strip Hardwood Floors,** both with features of especial value for gymnasiums, are included in two bulletins available from Robbins Flooring Co., Reed City, Mich. In addition to specifications, descriptions of the material, and installation data of particular interest to school administrators and architects, the leaflets list some of the users of these types of flooring.

For more details circle #507 on mailing card.

• A four-page **external newspaper** distributed bi-monthly and designed for school administrators, board members, architects, plant maintenance officials and others concerned with equipment for heating, ventilation and air conditioning is now published by American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.

For more details circle #508 on mailing card.

• Two data sheets, **"Chalkboard Care" (#SD-623) and "Classroom Sweeping Procedures" (#SD-621),** offer detailed descriptions of the correct and most effective methods for cleaning a blackboard and sweeping a typical classroom, and are available from Puritan Chemical Co., 916 Ashby St., N.W., Atlanta, Ga.

For more details circle #509 on mailing card.

• **"Adanlock Advantages"** is the title of a four-page folder which discusses the Thinwall partitions manufactured by Adanlock Corp., 61 Water St., Jamestown, N.Y. The illustrated booklet lists the advantages of the partitions, available in a complete choice of glass and panel combinations, and includes drawings of possible installations.

For more details circle #510 on mailing card.

• All **filmstrips, recordings and motion pictures** currently available from The Jam Handy Organization, 2821 E. Grand Blvd., Detroit 11, Mich., are listed in a new 28-page catalog, as are several new filmstrip kits scheduled for early release.

For more details circle #511 on mailing card.

(Continued on page 210)

Protect play areas with **REALOCK FENCE**

The giant steelman symbolizes the quality that is built into every section of Realock Fence. Realock is a permanent, low-cost way to enclose school yards, tennis courts, athletic fields, parking areas and other spaces where safety and limited access are desirable.

Realock's symmetrical design blends with the background. And Realock will *not* become "run down" looking because the steel fabric is galvanized *after* weaving to make it weather and corrosion resistant.

Realock Fence is engineered to take punishment. The steel has high strength, yet it is sufficiently resilient to prevent snapping or sagging. Sturdy posts set in concrete provide years of dependable service. Realock is also available in aluminum.

Realock's professional crews can erect your fence, or your own personnel can easily install it. For full details—and a free estimate—call the nearby CF&I sales office.

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION—Buffalo, New York

CF&I STEEL

REALOCK FENCE
THE COLORADO FUEL AND IRON CORPORATION
BRANCHES IN ALL KEY CITIES

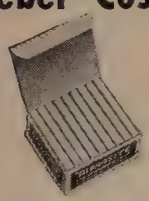
7162

Same as knife, fork and spoon, Weber Costello Chalkboard, Chalk and Erasers go together. It is natural that as pioneers in the manufacture of chalkboards we should have perfected chalk that is so compatible with chalkboards and erasers that clean "cleaner", faster.

Weber Costello Chalkboard

A complete range of chalkboard types—each a leader in its class. Soundly engineered writing surface that is "friendly" to chalk. —erases more easily. Scientifically correct in color. Every square foot guaranteed. Stocked, sold and serviced by qualified, experienced distributors.

Weber Costello Chalk



Based on years of manufacture, research and field study. A blend of components designed to provide thorough coverage, fluent writing and easy, complete erasing. Extruded for firmness, less breakage, and cleaner handling. Alpha pure white, P/C Alphasite polychromatic golden ivory and Omega in 8 erasable colors.

Double-Sewed Costello® Erasers

High quality, long fibre all felt erasers. Sections are bound to each other and to back by ten separate sewings—will outlast cheap erasers 3-to-1.

WRITE FOR SAMPLES of CHALK and LITERATURE.

Weber Costello Co. SINCE 1886 WORLD'S FINEST

Weber Costello Company
CHICAGO HEIGHTS, ILLINOIS

Manufacturers of: CHALKBOARD, CHALK, ERASERS, ART MATERIALS, MAPS, GLOBES

• Large screen projection of 3¼ by four and two by two inch slides can be effected with brilliant light even when room darkening is impractical with the powerful **carbon arc slide projectors** manufactured by Strong Electric Corp., 52 City Park Ave., Toledo 1, Ohio. A brochure giving details of the projectors and their use is available from the manufacturer.

For more details circle #512 on mailing card.

• **Monitor Language Laboratory Equipment** is the subject of an informative four-page folder available from Monitor Language Laboratories, Div. of Electronic Teaching Laboratories, Inc., 1818 M St. N.W., Washington 6, D.C. Originators of language laboratory equipment in 1949, Monitor includes all necessary equipment in its line. Detailed information on components of both Type I and Type II student units is presented in the folder.

For more details circle #513 on mailing card.

• The 1960 edition of **"Recipes and Menus for Schools and Camps"** contains not only interesting recipes for quantity cookery but helpful menu suggestions with space-age illustrations. Included in the book, available from John Sexton & Co., 4501 W. 47th St., Chicago 32, are charts of food values to meet Type A School Lunch Requirements, food serving chart, conversion tables and cost figures per serving.

For more details circle #514 on mailing card.

• A basic science library written for children from seven to 12, the **"How and Why"** science series, employs the question-and-answer technic to stimulate the child's curiosity and tell him what he wants to know. The books, published by Wonder Books, 1107 Broadway, New York 10, cover the fields of Rocks and Missiles, Electricity, Weather, Stars, Rocks and Minerals, and Dinosaurs, include full-color illustrations, diagrams and instructions for experiments, and are available in flexible bindings at 50c and hard covers at $1.00.

For more details circle #515 on mailing card.

• One-line specimens of all new and revived ATF faces are shown in the 32-page **Handy Type Index and Price List** available from American Type Founders Co., Inc., 200 Elmora Ave., Elizabeth, N.J. The two-color catalog includes a detailed illustrated glossary of terms used in type specification and other information.

For more details circle #516 on mailing card.

• **Catalog No. 15** displays the entire Wesco line of **steel office furniture** available from Western Mfg. Co., 532 N. Highland Ave., Aurora, Ill. The illustrated 24-page booklet shows desks, file cabinets, tables, bookcases, credenzas and accessories.

For more details circle #517 on mailing card.

• The University of California offers educators the opportunity to draw upon its resources through its motion picture library. A **bulletin** listing the many **educational films** available is offered by the Dept. of Visual Communication, University Extension, 405 Hilgard Ave., Los Angeles 24, Calif.

For more details circle #518 on mailing card.

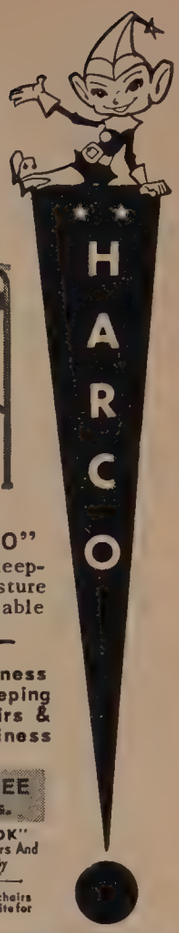
(Continued on page 212)

"HERBY" of HARCO says: "For Correct Posture, Adjust the Stand AND the Chair-

Model 2006A

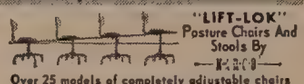
WITH MATCHED EQUIPMENT BY HARCO"

Adjustable typing and bookkeeping stands offer perfect posture when used with Harco adjustable "Lift-Lok" chairs.



manufacturers of Adj. Typing Stands — Business Machine Stands — Bookkeeping Stands — "Lift-Lok" Chairs & Stools — L-Shaped "Business Trainers".

Write, Wire or Call for FREE 30 day trial and details.



"LIFT-LOK" Posture Chairs And Stools By HARCO

Over 25 models of completely adjustable chairs and stools. Full 7" height adjustment. Write for catalog and price list of complete line.

GARRETT TUBULAR PRODUCTS, INC.
P. O. BOX 237 DEPT. BEW GARRETT, INDIANA

Vallen

CURTAIN OPERATING EQUIPMENT

★ "Noiseless" Curtain Tracks
★ Electric Curtain Controls
★ Special Operating Devices

Vallen #175 Curtain Track

Can Be Recessed in Plaster! For room partitioning, displays, wide windows

Vallen Panorama

For T.V. Studios, School Theaters

Curtain Operating Problems? Write

Vallen inc.
akron 4, ohio

world famous for the finest curtain operating equipment since 1916

Why BRILLO *SUPERWELD* FLOOR PADS

give extra long service in floor maintenance

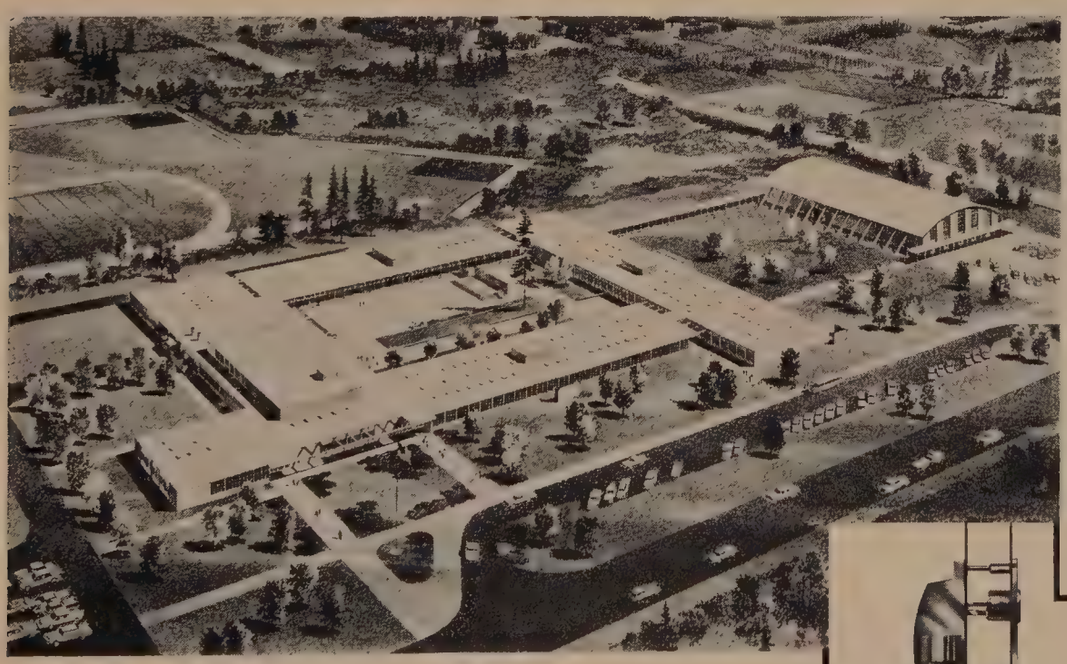
Brillo Superweld is a radically new kind of floor pad. Its steel wool fibers are welded to form radial reinforced ribs. This means a more durable pad, a less costly operation for you.

Brillo Superweld enhances floor finish
Its metal fibers are cross-stranded in every direction . . . give a better cleaning and polishing section on all types of floors—asphalt, hardwood, linoleum or vinyl.

Brillo Superweld lasts longer
A strong, yet flexible radial weld holds these metal fibers securely in place—adding greater strength and durability. Brillo Superweld can be used over and over again.

Brillo Superweld lowers maintenance costs
Every Brillo Superweld Pad has powerful abrasive action—enables your machine to work rapidly—gives floors a higher gloss. You save time and money when you use the new Brillo Superweld Floor Pads. See your supplier, or write:

BRILLO MANUFACTURING COMPANY, INC.
60 John Street, Brooklyn 1, New York



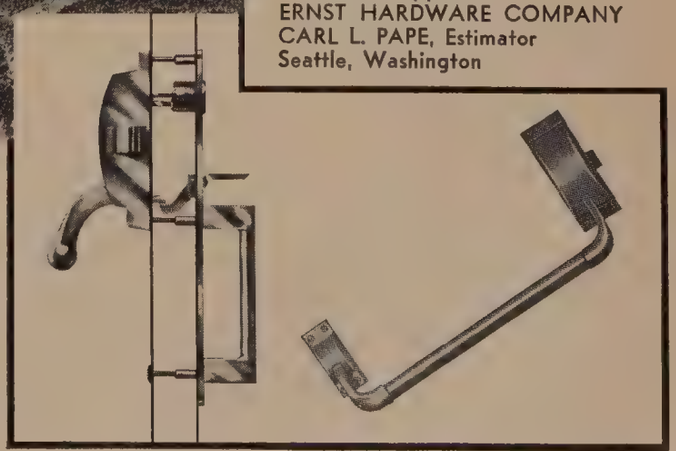
Sammamish High School

Bellevue, Washington

Architects & Engineers:
NARAMORE, BAIN, BRADY & JOHANSON
Seattle, Washington

General Contractors:
GEORGE E. TEUFEL CO.
Seattle, Washington

Hardware Supplier:
ERNST HARDWARE COMPANY
CARL L. PAPE, Estimator
Seattle, Washington



Sixty-one SG-5300 Series Exit Devices with Uni-Trim and mullions were selected by the Bellevue, Washington, School District No. 405 for added security, less maintenance and assurance of safe exit.

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• **"A New Way to Solve School Food Problems"** is the title of a 14-minute color slide film presentation which deals with food service in schools and colleges and shows the new role automatic merchandising is playing. The slide film and accompanying recorded narrative are available from Vendo Co., 7400 E. 12th St., Kansas City 2, Mo.

For more details circle #519 on mailing card.

• **"How to Cut Costs for Grounds Maintenance"** is the title of a 16-page brochure released by Gravely Tractors, Dunbar, West Va. Information on equipment for large area mowing, mowing the rough, snow moving, and general mowing problems is presented with catalog data on other equipment and tools for grounds care.

For more details circle #520 on mailing card.

• Golden Anniversary models are included in the 44-page **Catalog No. 69,** which describes and illustrates the Boice-Crane line of saws, drills, lathes and other power tools. The new Challenger 10-inch tilt arbor saw is among the items listed in the booklet available from Boice-Crane Co., 975 W. Central Ave., Toledo 6, Ohio.

For more details circle #521 on mailing card.

Film Releases

"The Guardians," sound filmstrip for use in health education, science, social studies and home economics classes in grades 7 to 12, tells the story of the physician from the era of ancient Greece to the present day and describes medical advances through the centuries. **The National Assn. of Blue Shield Plans, 425 N. Michigan Ave., Chicago 11.**

For more details circle #522 on mailing card.

Four film series presenting a comprehensive variety of communications technics for a better exchange of ideas: "Language in Action," "The Quill," "Language and Linguistics," and "Talking Sense." "Twentieth Century Revolutions in World Affairs," series of nine 30-minute films for high school and college social studies classes documents the past sixty years. "Survival in the Sea," four 30-min. films for high school and college biology classes on marine life. **Audio-Visual Center, Indiana University, Bloomington, Ind.**

For more details circle #523 on mailing card.

Suppliers' News

Brunswick Corp., 623 S. Wabash Ave., Chicago 5, announces removal of its **School Equipment Division** marketing and advertising departments from Chicago to the company's modern plant at **2605 N. Kilgore Rd., Kalamazoo, Mich.**

Universal Bleacher Co., Champaign, Ill., manufacturer of portable and folding bleachers, announces acquisition of **E-Z-Fold, Inc., Spearville, Kans.,** manufacturer of a complete line of basketball backstops, including the remote electrically operated Hoist Way type, stationary backstops and basketball backboards. **Victor W. Claussen,** general manager of E-Z-Fold, will retain responsibility for operations at Spearville, according to the report, and E-Z-Fold will operate as a separate division of Universal Bleacher.

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Simple, fast, easy-to-use coin tubes each in its own standard bank color. Precision molded in unbreakable hi-linear polyethylene, **penny tubes** are **red** and package 50c rolls; **nickel tubes, blue,** $2.00 rolls; **dime tubes, green,** $5.00 rolls; **quarter tubes, orange,** $10.00 rolls. Used with standard flat, tubular coin wrappers.

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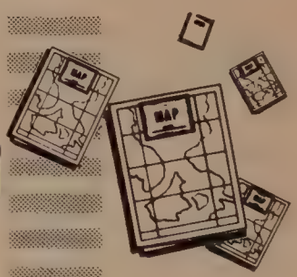

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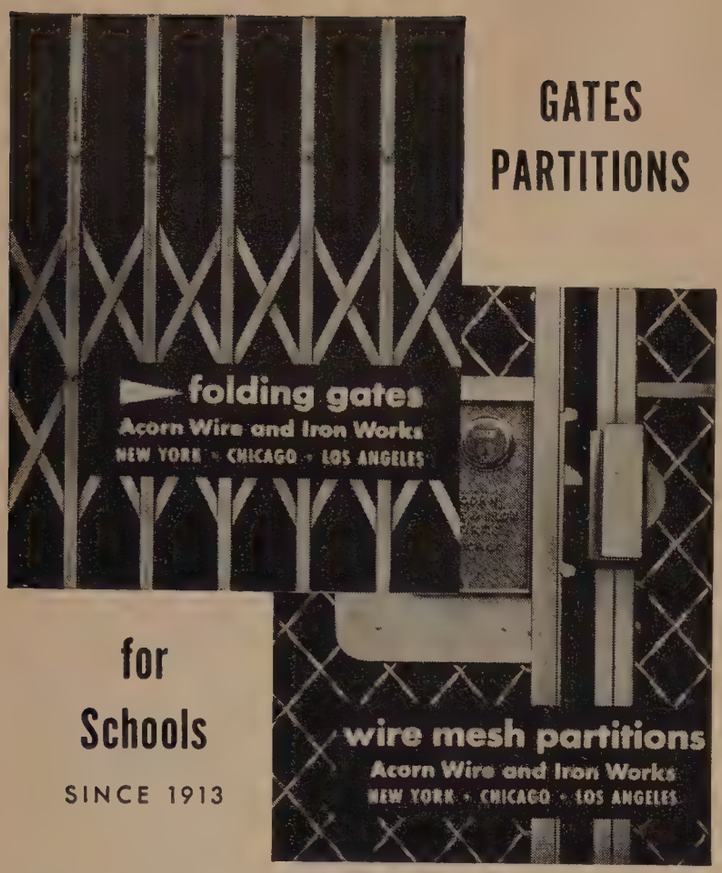
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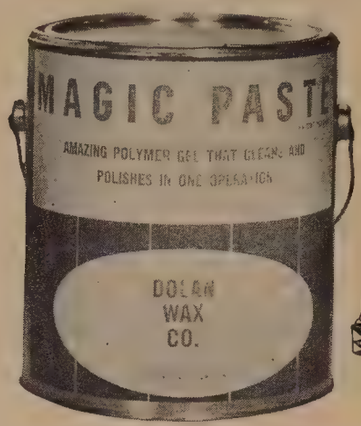

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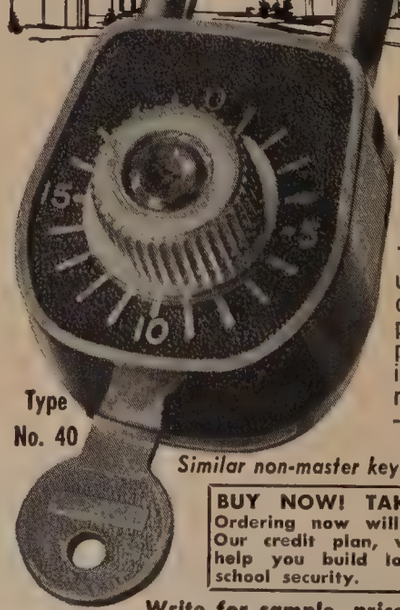

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USE THIS PAGE TO REQUEST PRODUCT INFORMATION

The index on this and the following page lists advertisements in this magazine alphabetically by manufacturer. For additional information about any product or service advertised, circle the manufacturer's key number on the detachable postcard and mail it. No postage is required.

Products described in the "What's New" pages of this magazine also have key numbers which appear in each instance following the description of the item. For more information about these items, circle the appropriate numbers on the postcard and mail it, without postage, to The Nation's Schools.

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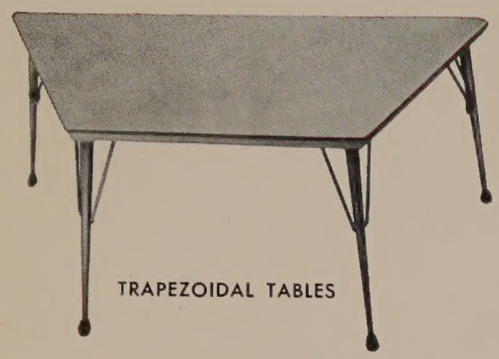
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Plate No. 1095

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Akron, Ohio

Mural Artists: LUKE & ROLAND LIETZKE
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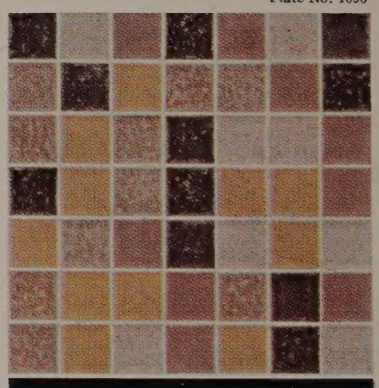

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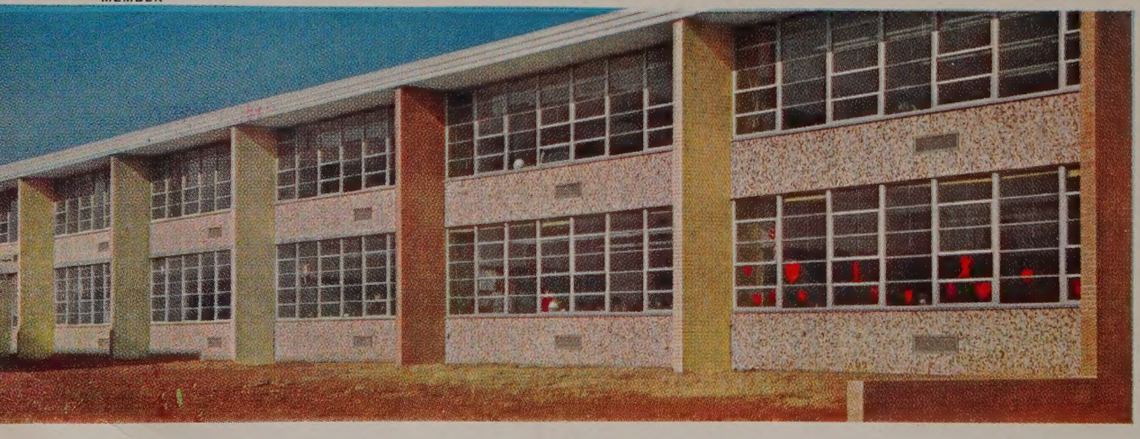

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